





To Insert New Leaves In This Binder

TAKE out the
screws and re-
move the top cover.

Find the place
where new leaf is
to be inserted and
lift up, WITH brass sleeves, all leaves above point
where insertion is to be made.



Then insert new leaf; put the top cover back,
replace the screws and fasten them down.

OTIS ELEVATOR CO.

OTIS
ELEVATOR
COMPANY



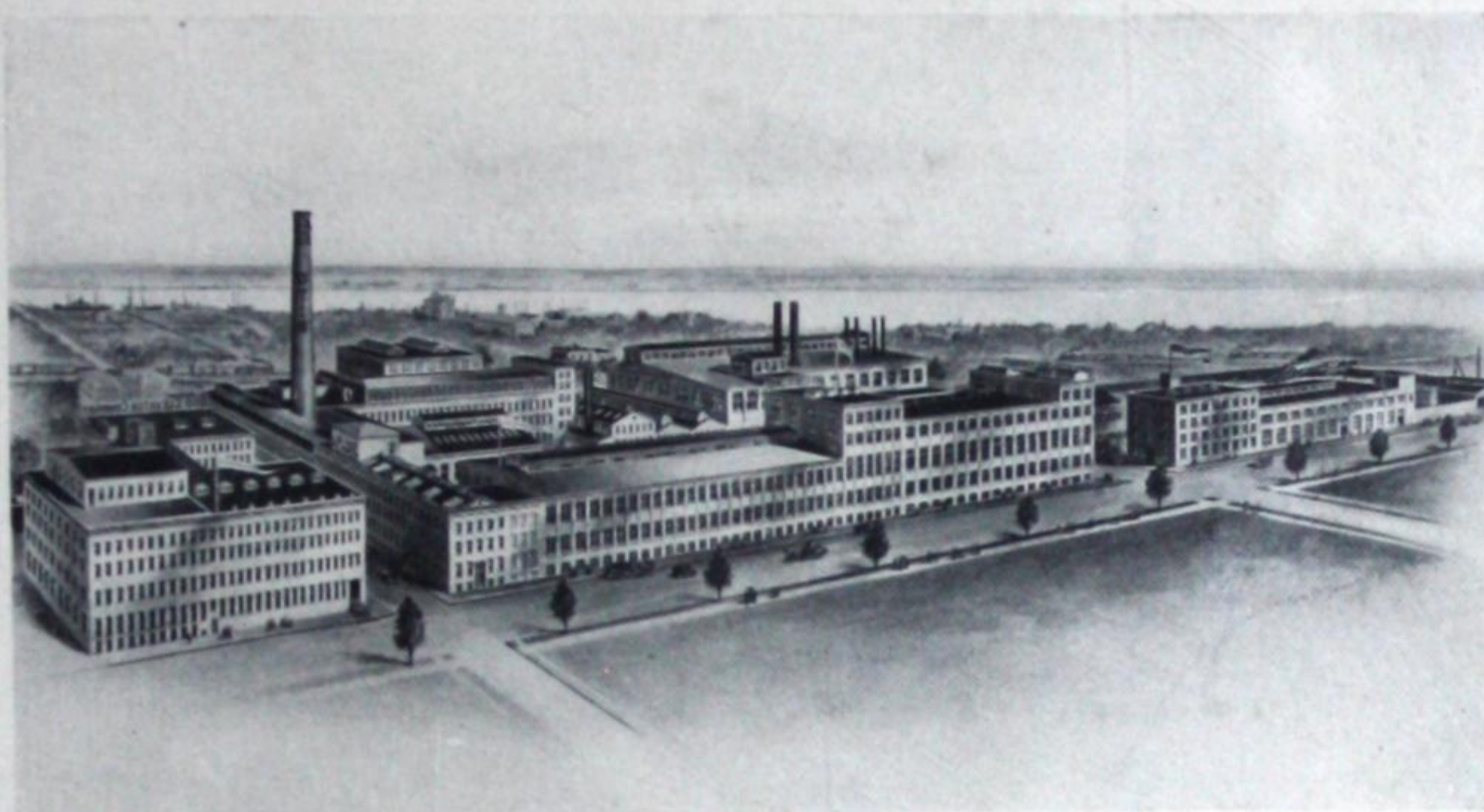
TRACTION
ELEVATORS



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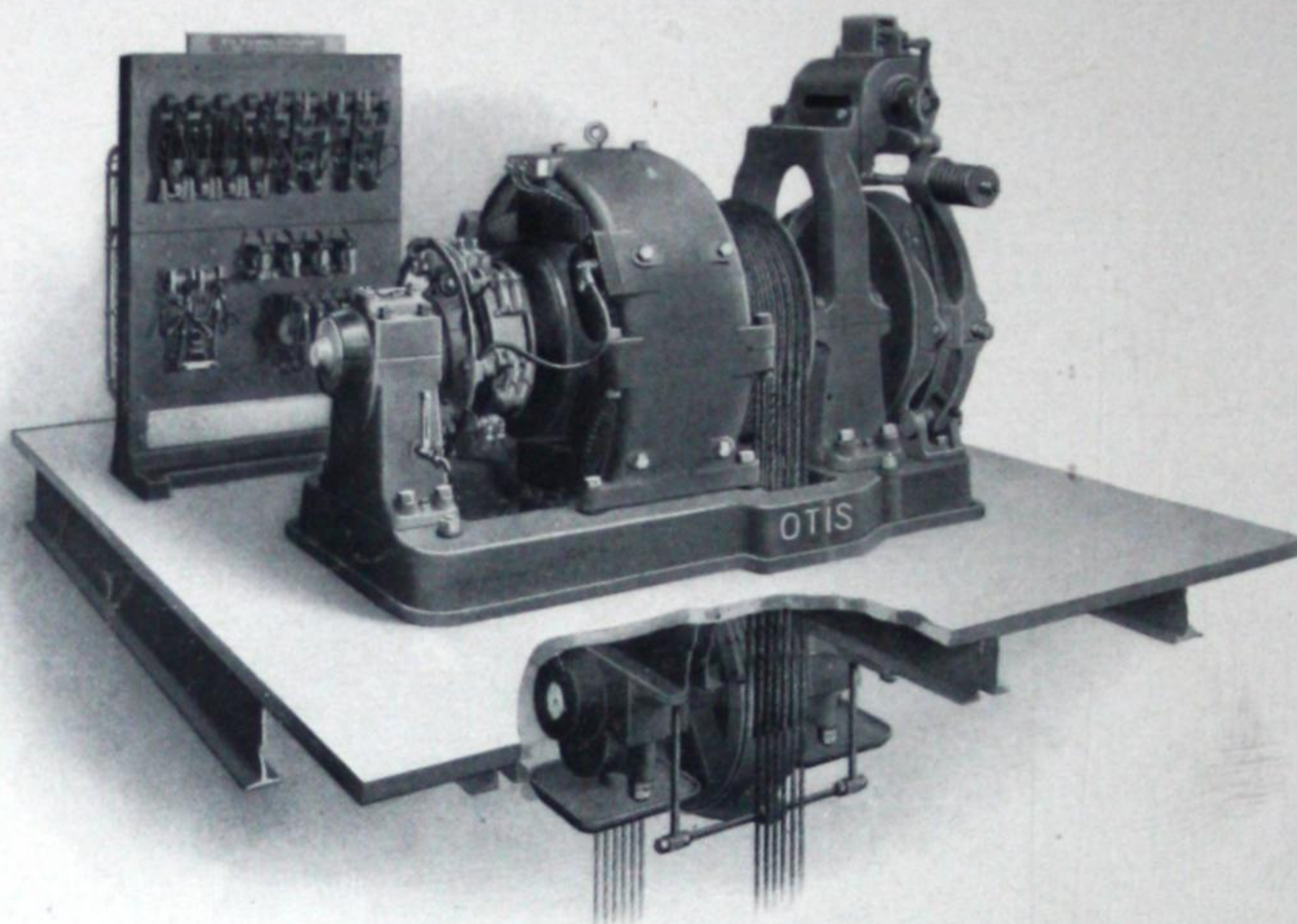
OTIS TRACTION ELEVATORS



OTIS ELEVATOR COMPANY, YONKERS WORKS, YONKERS, N. Y.

OTIS
ELEVATOR COMPANY

OFFICES IN ALL THE PRINCIPAL CITIES
OF THE WORLD



GEARLESS TRACTION ELEVATOR MACHINE 1:1 ROPING

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OTIS ELEVATOR COMPANY

GEARLESS TRACTION ELEVATOR

1 : 1 ROPING



HIS invention, unique in elevator patents, is the logical result of the tendency of the day to the greatest simplicity, combined with maximum economy and the highest possible degree of safety. No one who has ridden on one of these elevators has failed to appreciate that the machine able to accomplish what this one does so easily and smoothly, at the same time impressing the passenger with such a feeling of solidity and security, is the machine which the public has wanted and will want from now on.

As the public is intensely interested in anything relating to the greatest buildings of modern times, the Metropolitan, Singer, and Woolworth towers, and especially in the apparatus which will take it to the tops of these 600 and 700-foot structures in one minute from the street level, the following brief description of the elevators that accomplish this will undoubtedly prove of interest.

The Otis Electric Traction Elevator derives its name from the fact that motion is obtained by means of the traction existing between the driving sheave and the hoisting cables. In order to produce the necessary tension for this result, the hoisting cables, from one end of which is suspended the car and at the other end the counterweight, pass partially around the traction driving sheave in lieu of a drum, continuing around an idler leading sheave, thence again around the driving sheave, thereby forming a complete loop around these two sheaves. The principle and method of roping just outlined is plainly shown in Figure 1.

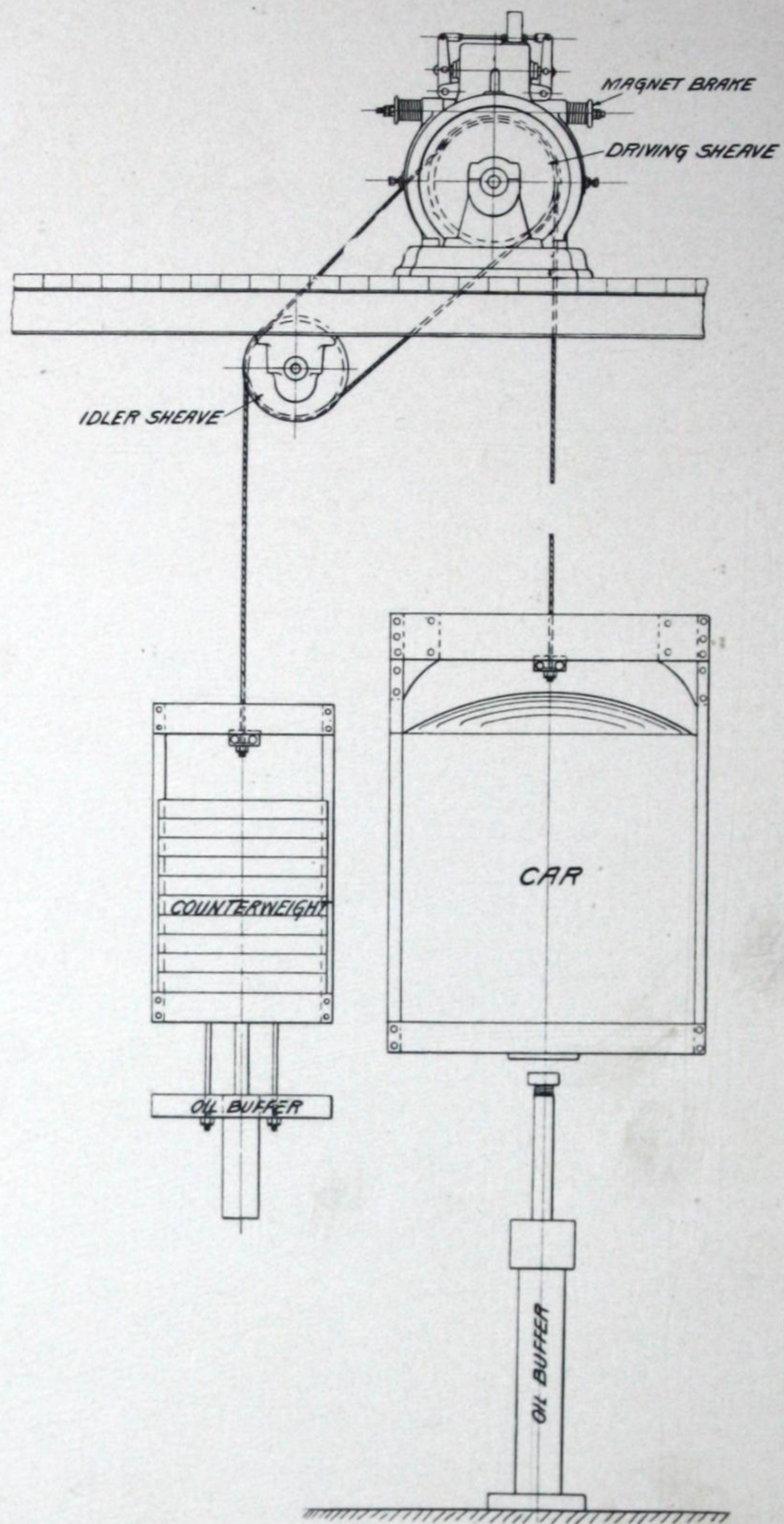


FIGURE 1
GENERAL ARRANGEMENT OF ROPING FOR OTIS 1:1 GEARLESS
TRACTION ELEVATOR INSTALLATION

In this type of elevator the working parts have been reduced to the simplest possible elements, but at the same time absolute safety and perfection of operation have been secured by the application of a sufficient number of highly ingenious devices and controlling features.

The machine itself consists essentially of a motor, a traction driving sheave and a magnetically released spring applied brake, all compactly grouped and mounted on a continuous heavy iron bed. Instead of the high-speed motor customarily used with the Geared Electric Elevator, a slow speed shunt wound motor designed especially for the service is employed. These motors, contrary to an erroneous popular belief in regard to slow speed motors in general, have a remarkably high efficiency. The armature shaft which is of high tensile steel of ample strength serves merely as a support for the load and on it are mounted the brake pulley and driving sheave. The actual drive from the armature spider to the sheave is effected through a flange integral with the spider and bolted directly to the sheave, thus eliminating all torsional strains to the shaft, and the use of keys.

The advantages of this type of elevator over the Geared Drum type are obvious. The Gearless Traction Elevator may be used for any rise whatsoever, because this invention does not have to consider a drum upon which the hoisting cables are wound. The direct drive and consequent elimination of all intermediate gearing between the motor and driving member results in a machine of very high efficiency and absolutely prevents any possibility of vibration or noise that might perhaps occur from the imperfect wearing of a system of gears. With the slow speed motor employed the armature momentum is much less than with a smaller high speed

armature, and therefore permits of greater ease in starting and stopping, resulting in a smooth and practically faultless movement of the car. Moreover, the compact and simple arrangement of parts permits of the greatest simplicity of installation and economy of space, especially if the machine itself be located over the hoistway.

The controller used with these elevators embodies the very latest and approved application of electromagnetic switches. It is actuated by a master switch in the car and gives starting, accelerating, retarding and stopping effects unexcelled by even the most costly, high-grade, hydraulic equipments.

The controller is so designed in connection with the motor that the initial retardation of the car in coming to rest is independent of the brake, the latter being requisitioned to bring the car to a final and positive stop and to hold it at the landings.

The motor is also governed in such a way, electrically, as to prevent the car from attaining any excessive speed, no matter what the load in it may be.

In designing the controlling equipment, one of the features demanding greatest consideration, in view of the very high speed at which the cars run, is the automatic retarding of their speed to a final stop at the upper and lower terminals of travel. This result is very satisfactorily attained by two multi-arm switches located on the car—one for the up and one for the down motion. These switches are operated by cams in the hatchway, that open the contacts, one after the other, as the car approaches the limits of travel. This automatic feature is entirely independent of the operator in the car and is effective even though the car operating device be left in the full speed position.

The usual safety devices installed in connection with modern high-grade apparatus, are used with this type of elevator, including speed governors, wedge clamp safety devices for gripping the rails in case of the car attaining excessive speed and potential switches. One particularly prominent safeguard resulting from the arrangement and the method of driving the cables, is the decrease in traction which follows the bottoming of either the car or the counterweight on their oil buffers. This minimizes the lifting power of the motor, until normal conditions are resumed. Inasmuch as in any properly constructed elevator the roping is so arranged that the counterweight will rest on its oil buffer before the car reaches the overhead work, or vice versa, it therefore will be seen that the above mentioned decrease in tractive effort is a very valuable and effective safety feature inherent in this type of elevator.

A feature of security of the greatest interest and importance is provided in the Otis Patented Oil Cushion Buffers, a cut of which will be found on this page. These are placed in the hoistway, one under the car and one under the counterweight, and are arranged to bring either the car or the counterweight to a positive stop, through the displacement of the oil in the buffer at a carefully calculated rate of speed which is regulated by the escape of oil from one chamber of the buffer to another. The buffers have been proven capable by test

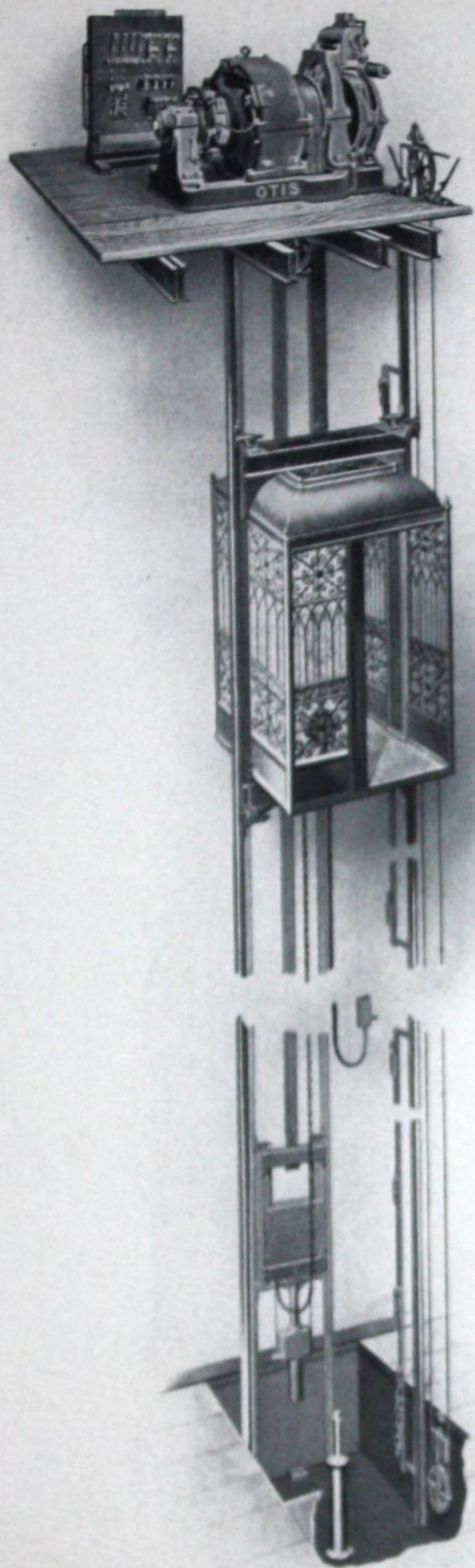


OTIS PATENTED SPRING
RETURN OIL BUFFER

of bringing a loaded car safely to rest from full speed without discomfort to those in the car and in this respect are unique among elevator safety features.

In general it may be said that the refinements that have been worked out and the perfection that has been reached have resulted in an apparatus which has given a remarkable demonstration of its safety, economy and traffic handling efficiency, and has adequately satisfied the demand for an elevator of this type. This is conclusively indicated by the large number of existing installations in all parts of the country.

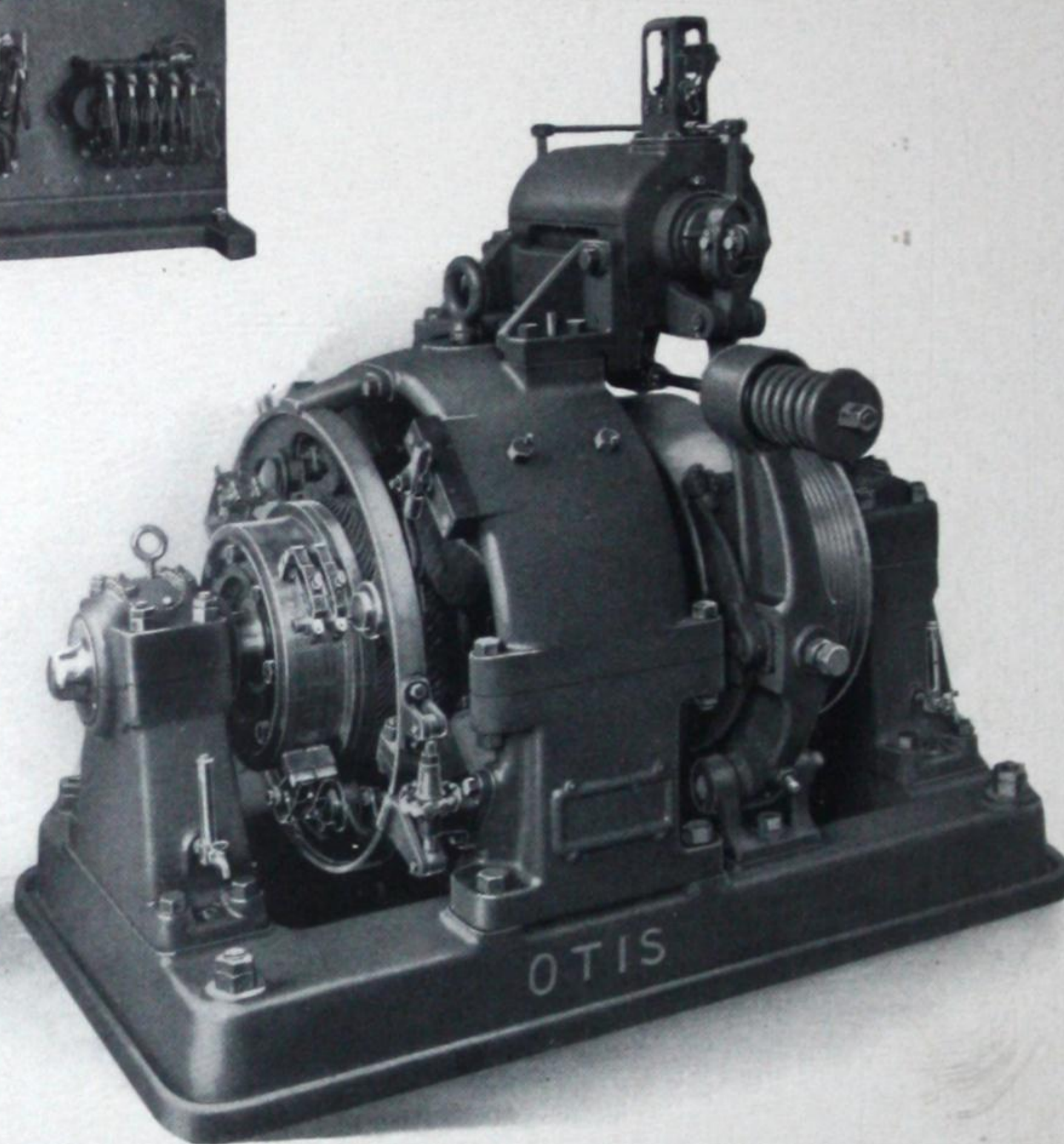
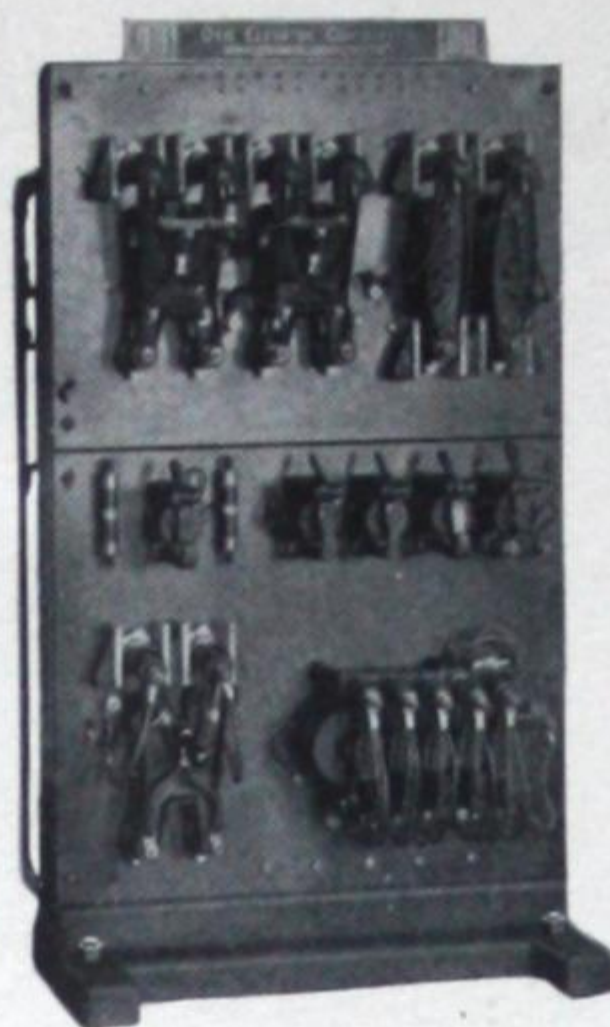
Those who have already had the opportunity of seeing all of New York and the surrounding country for a radius of 35 or 40 miles spread at their feet, should bear in mind the fact that to the elevator more than to any other one device are due the structures which give them this lofty outlook.



COMPLETE GEARLESS TRACTION
ELEVATOR INSTALLATION

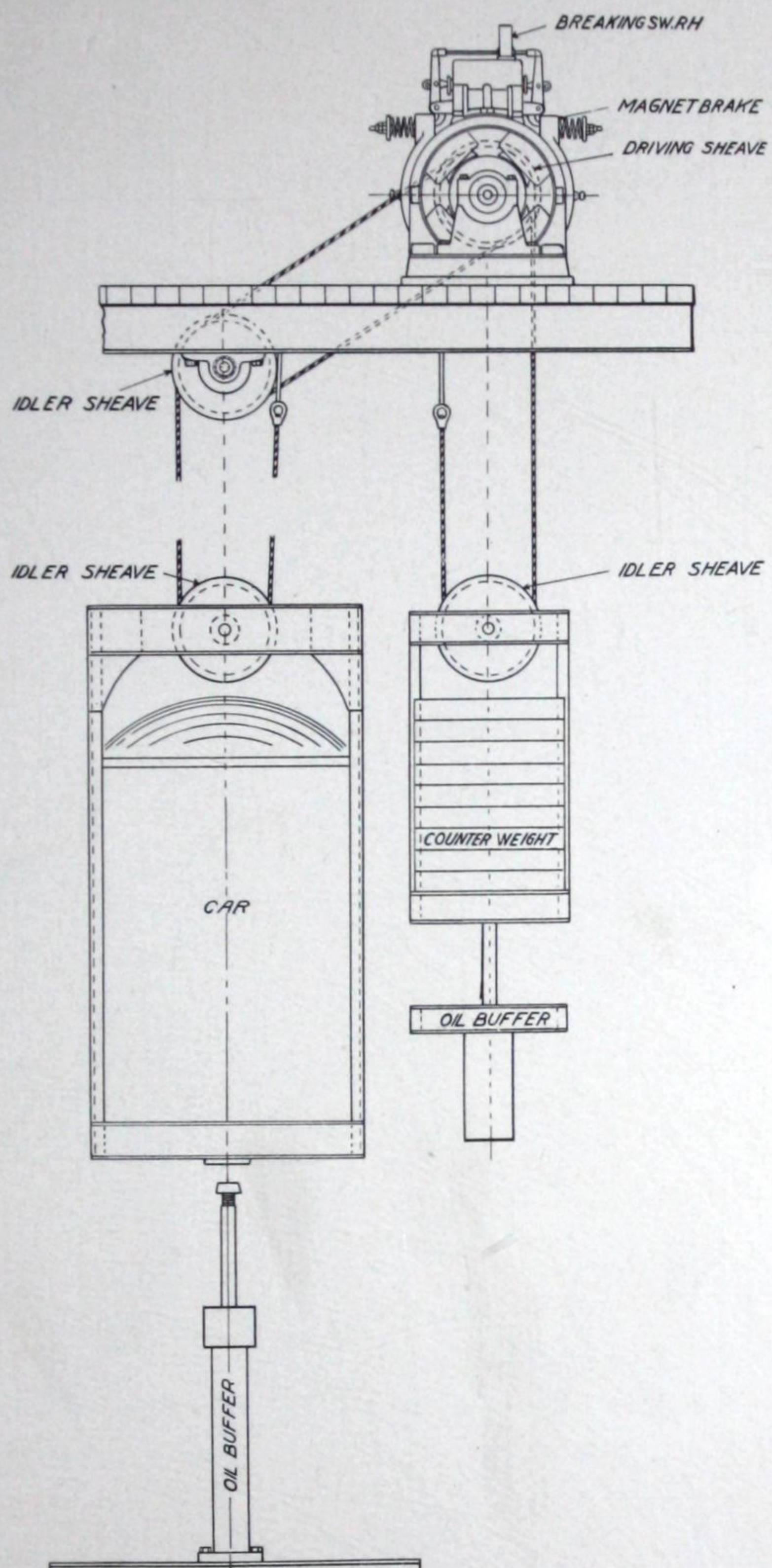
GEARLESS TRACTION ELEVATOR

2 : 1 ROPING



GEARLESS TRACTION ELEVATOR MACHINE, 2 : 1 ROPING

This elevator is an adaptation of the High Speed Gearless Traction Type, permitting of slower speeds by roping the car and counterweight 2 : 1, still retaining a slow speed motor with Gearless Drive.

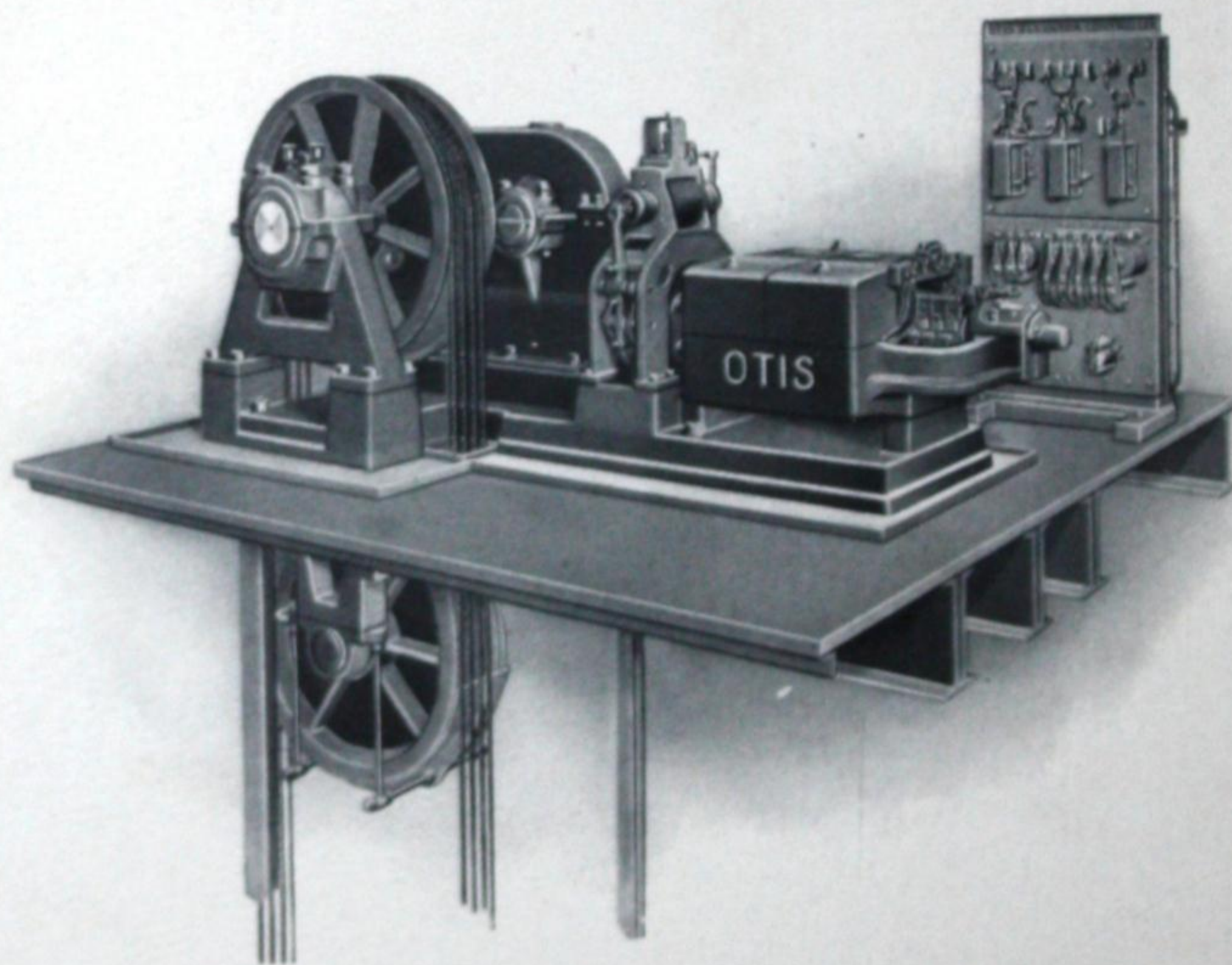


GENERAL ARRANGEMENT OF ROPING FOR OTIS 2:1 GEARLESS
TRACTION ELEVATOR INSTALLATION

GEARED TRACTION ELEVATOR

The modern adaptation, in the Otis Traction Elevator, of the traction principle for elevator service which utilizes the patented feature of operating the car by means of driving the cables direct from the motor without the intervention of retarding rigging, showed so conclusively the merits of that principle that the question naturally arose as to the feasibility of employing this method of drive in the low speed machines as well. The result was the introduction of what is commercially known as the Otis Geared Traction Elevator, which embodies many of the good points of its larger contemporary.

It might be well to state here that the traction principle is neither new nor experimental, as is demonstrated by its use in the familiar type of carriage hoist, this



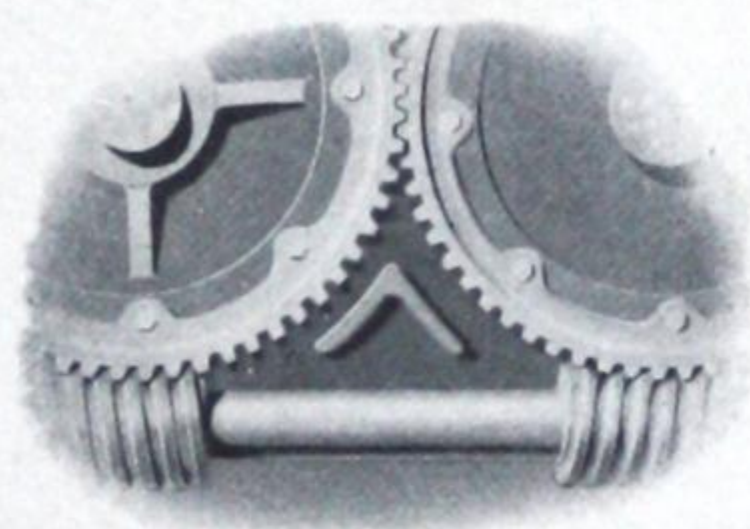
OTIS DIRECT CURRENT DOUBLE SCREW TRACTION ELEVATOR MACHINE
DESIGNED FOR OVERHEAD INSTALLATION

being in reality a low duty hand power traction elevator driven by means of a hemp rope; also this method of drive has been employed on dumb-waiters for some time. However, as applied to the high speed passenger machines used in our tall office buildings, it must be referred to as a comparatively new and improved development of former types.

The Geared Traction machine is similar in appearance to the standard drum machine, except that a multi-grooved driving sheave is mounted in place of the drum, and a non-vibrating idler leading sheave takes the place of the vibrating sheave necessary on the drum type. The car and the counterbalance weight hang directly from the driving sheave—one from either end of the cables—in precisely the same manner as with the Otis Gearless Traction Elevator, the necessary amount of traction being obtained by the extra turn of the cables resulting from passing around the idler sheave.

The machines are built in two classes, double screw and single screw, depending upon the duty required.

The double screw machine is designed for the heavier duties, and the gearing consists of a right and left hand worm, accurately cut from a solid forging. This worm, coupled directly to the electric motor, runs submerged in oil and meshes with two large bronze gear wheels



THREE-POINT DRIVE ELIMINATING
END THRUST ON WORM SHAFT

which in turn mesh with each other. The effect of the three-point drive thus obtained in conjunction with the right and left hand thread, is the entire elimination of end thrust on the worm shaft—a most desirable feature. The complete gear is fully protected in an oil tight iron case and is well lubricated in every part.

Where space permits, three bearings are provided, supporting the driving sheave, worm wheel and their shaft. The shaft passes directly through the driving sheave and the worm wheel center, and is securely keyed to both, thus providing a mechanically strong and satisfactory drive.

When compelled to use but two bearings, what is termed a "buffer neck drive" is employed. This consists of a buffer neck or driving spider, with extending arms and a flange that is bolted to the gear wheel near its periphery. Similar projecting arms are provided on the driving sheave. These two sets of arms are bolted together, but flexible spacers are placed between them in order to distribute the load equally on all arms.

The machine is equipped with a mechanically applied and electrically released double shoe brake. The shoes are applied against a pulley of ample diameter and width to dissipate any heat generated, which also serves as a coupling between the motor shaft and the worm shaft.

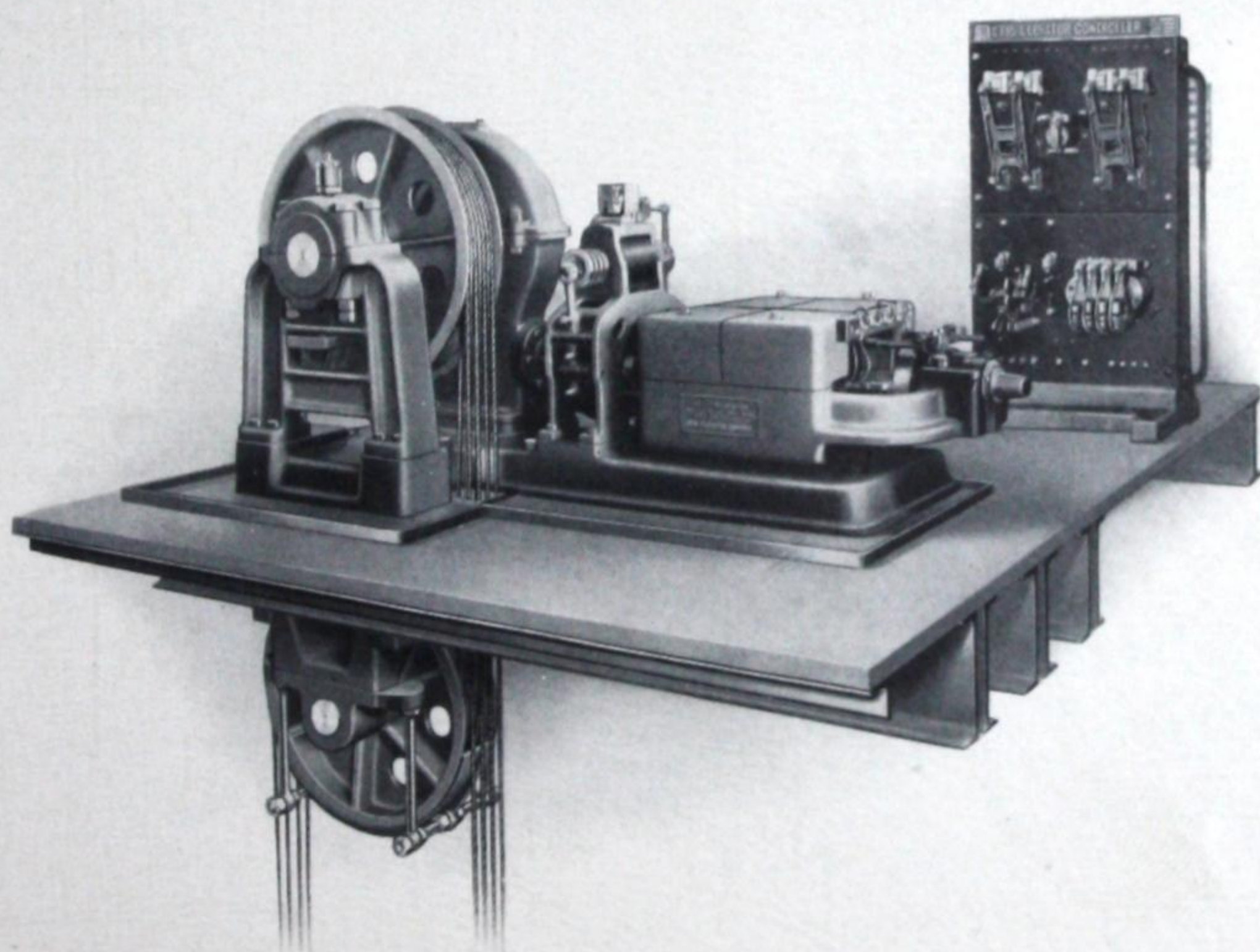
The brake shoes, normally, are bearing against the pulley with a pressure corresponding to the compression of the two helical springs. When current is admitted to the solenoid brake magnet, and then only, the action of the springs for the time is overcome, so that the shoes are released. It will be seen, therefore, that the brake will apply with full force should a failure of current occur, resulting in an immediate stop of the elevator.

The motor is compound wound and runs usually at about eight hundred revolutions per minute at full car speed and load. The series field is used only at starting to obtain a highly saturated field in the shortest possible time, and is then short-circuited, allowing the motor to run as a plain shunt wound type.

In stopping, a comparatively low resistance field is thrown across the armature, providing a dynamic brake

action and a gentle slowing down of the car, the brake being called upon only to effect the final stop and to hold the load at rest. Resistance in series with this "Extra Field," as it is called, is controlled by magnets which depend, in their operation, on the speed of the armature. It is therefore evident that the dynamic or retarding effect of the field is proportional to the speed, and therefore to the load in the elevator; hence good stops under all conditions are easily obtained.

Rope guards are provided to prevent the cables from leaving their grooves in the event of either car or counterweight bottoming. The same effect is obtained on these machines as on the Otis Gearless Traction Elevators when the cars or counterweights strike their buffers in the pit; namely, that the tractive effort is so much reduced as to make it impossible for the sheave to drive the cables. This is a most desirable characteristic inher-



OTIS DIRECT CURRENT SINGLE SCREW TRACTION ELEVATOR MACHINE
DESIGNED FOR OVERHEAD INSTALLATION

ent in all traction machines for the reason that rope strains can never increase beyond a certain limit, well within the factor of safety of the cables and fastenings. This means that the danger of the car or weight dropping, as a result of being pulled into the overhead work, and thus breaking cables or fastenings, is eliminated.

The Controller, whose magnets operate the various switches, is complete in every detail and consists of "Potential," "Reversing" and "Fast Speed" switches, "Accelerating," "Load" and "Auxiliary Load" magnets. The resistances are all carried on the back of the Controller and are easily accessible.

These machines can be arranged for car speeds up to 400 feet per minute with 2,500 pounds, or decreased speeds with corresponding increased loads.

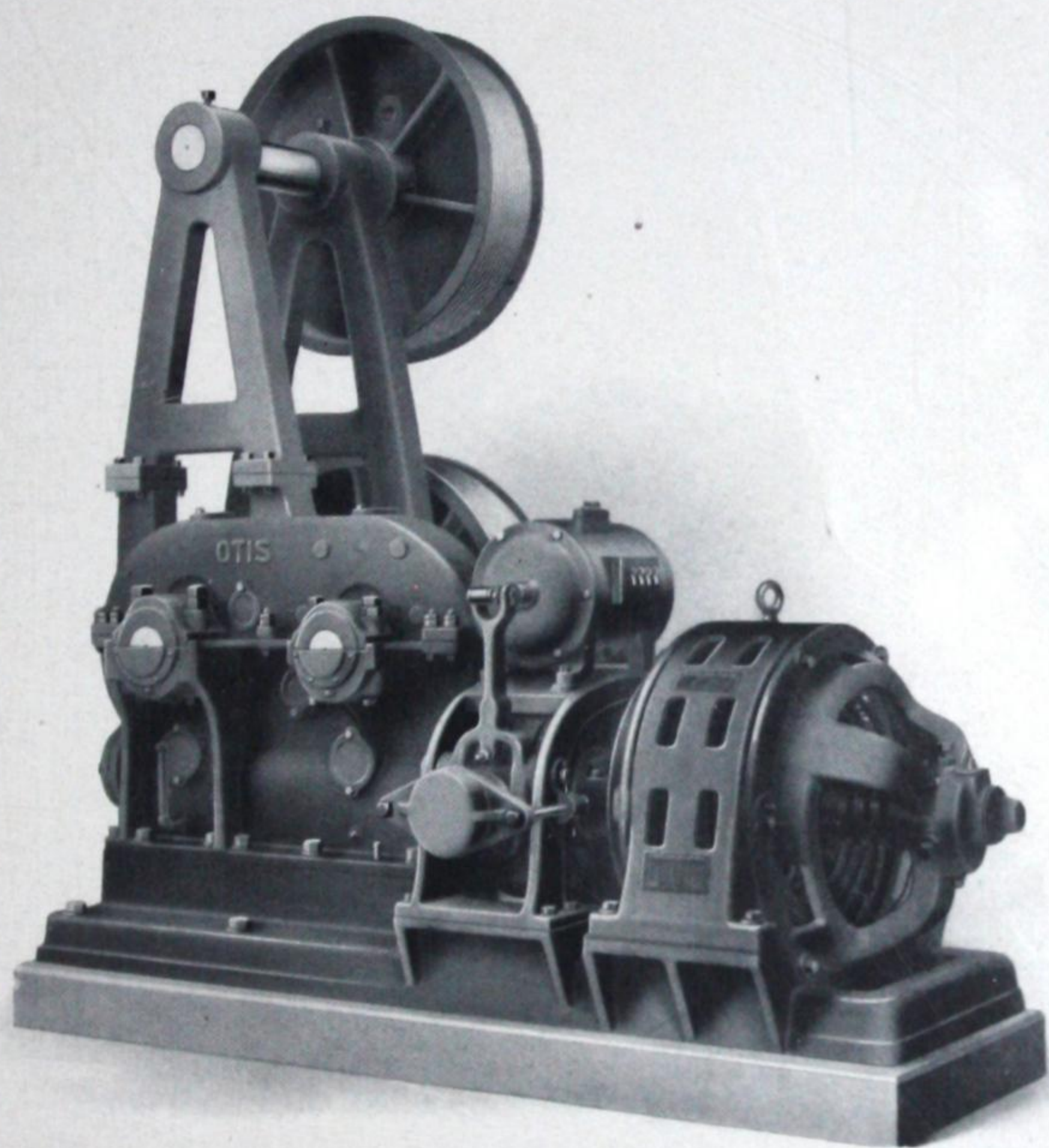
For the lighter duties the single screw machine referred to is furnished, and is essentially the same as the double screw except that it has a single worm meshing with a single gear wheel—a cut of this type being shown on the preceding page.

To meet the demands in districts where Alternating Current is in use, the same apparatus described is furnished except that the direct current motor and controller give place to an alternating current motor and controller.

The Alternating Current machines are made in two classes also, single and double screw. The cut shown on the opposite page represents a double screw machine designed for basement installations. The brake is slightly different in appearance but performs the same functions as does the direct current brake.

The safeties used on the Otis Gearless Traction Elevators are found on the Geared Traction Elevators.

The main difference between the two machines lies in the ability to use on the latter a small high speed motor with gearing, instead of the large, slow speed highly efficient, but more expensive motor of the Otis Gearless Traction Elevator.



OTIS ALTERNATING CURRENT DOUBLE SCREW TRACTION ELEVATOR MACHINE
DESIGNED FOR BASEMENT INSTALLATION

THE HERRINGBONE GEAR TRACTION ELEVATOR

In addition to the application of the traction principle already described we are now building machines of the traction type that employ herringbone gears in place of worm and gear or ordinary spur gear arrangement.

These machines are the result of a popular demand for the production of a machine with high gear efficiency using motors of moderate speed.

The gears employed are of the Wuest type, and are not made up of separate helical gears bolted together, but consist of one gear rim on which are cut two sets of helical teeth, properly staggered.

The pinion and shaft driving these are in one solid piece, and the teeth are cut in a manner similar to the gear.

These gears are cut with great accuracy, and run in perfect alignment, immersed in an oil bath.

The controlling and safety features for these machines are practically the same as for the ordinary Otis Geared Traction Machine, already described.





WOOLWORTH BUILDING, NEW YORK CITY

This building, the tallest in the world, is equipped with 26 Otis Gearless Traction Elevators. Two of the elevators run from the first to the fifty-first floor with actual travels of 679 feet 9½ inches and 679 feet 10¼ inches respectively. There is also a shuttle elevator which runs from the fifty-first to the fifty-fourth floor.

Total height of building from curb to base of flag staff, 785 feet.

BUILDINGS EQUIPPED WITH OTIS GEARLESS TRACTION ELEVATORS

1:1 GEARLESS TRACTION ELEVATORS

Building	Location	No. of Elevators
Third National Bank	Atlanta, Ga.	5
Emerson Hotel Company	Baltimore, Md.	2
First Avenue Improvement Company	Birmingham, Ala.	5
Edison Electric Illuminating Co.	Boston, Mass.	2
New England Tel. & Tel. Company	"	4
Buxton, Cassini & Company	Buenos Ayres, Argentine	1
Railway Clearing House	"	3
Marine National Bank	Buffalo, N. Y.	6
N. Y. Telephone Co.	"	4
Hamilton National Bank	Chattanooga, Tenn.	3
Majestic Building	Chicago, Ill.	4
Cook County Court House	"	7
Republic Building	"	7
Peoples Gas Light & Coke Company	"	14
Blackstone Hotel	"	4
Chicago City Hall	"	7
J. L. Kesner	"	5
Hotel Sherman	"	4
Karpen Building	"	6
Insurance Exchange Building	"	16
Monroe Building	"	6
City Hall Square Building	"	5
North American Building	"	7
Otis Building	"	8
Chicago Telephone Company	"	8
Burlington Building	"	8
Lytton Building	"	6
Brotherhood of Locomotive Engineers	Cleveland, Ohio	4
Cleveland Telephone Company	"	2
Statler Hotel	"	4
The Cuyahoga Company	"	3
Hollenden Hotel	"	4
The Cleveland Arcade Co.	"	6
Praetorian Building	Dallas, Texas	3
Southwestern Life Insurance Co.	"	4
Adolphus Hotel	"	1
Commonwealth National Bank	"	3
First National Bank	Denver, Col.	5
Metropolitan Building	"	2
Foster Building	"	4
Daniels & Fischer	"	1
Equitable Life Insurance Company	Des Moines, Iowa	3

1:1 GEARLESS TRACTION ELEVATORS

Building	Location	No. of Elevators
Union Trust Company	Detroit, Mich.	3
Froud Building	"	2
Hunter & Hunter	"	2
W. H. Elliott	"	3
Hotel Pontchartrain	"	2
Detroit Free Press Building	"	3
Dime Savings Bank	"	9
Alworth Building	Duluth, Minn.	2
W. G. Kerpelsheimer	Grand Rapids, Mich.	2
S. F. Carter Building	Houston, Texas	4
Union National Bank	"	3
New Rice Hotel	"	3
Indianapolis News Building	Indianapolis, Ind.	2
Lemcke Annex	"	4
Scarritt Estate	Kansas City, Mo.	4
Los Angeles Trust & Savings Bank	Los Angeles, Cal.	3
Los Angeles Investment Co.	"	4
I. M. Van Nuys Building	"	6
Lincoln Savings Bank	Louisville, Ky.	2
John G. Starks Building	"	4
Cotton Exchange	Memphis, Tenn.	7
Majestic Theatre & Office Building	Milwaukee, Wis.	4
First National Bank	"	8
J. E. Andrus	Minneapolis, Minn.	3
Radisson Hotel	"	3
Chamber of Commerce	"	2
Flour & Corn Exchange	"	3
Barnes Estate	Muskogee, Okla.	2
Prudential Life Insurance Company	Newark, N. J.	4
N. Y. & N. J. Telephone Company	"	3
Hudson Terminal Building	New York City	39
Whitehall Building	"	29
No. 1 Wall Street	"	3
Singer Building	"	15
Pulitzer Building	"	7
Silversmiths Building	"	4
Metropolitan Life Insurance Co.	"	6
Fifth Avenue Building	"	19
Down Town Building	"	8
Masonic Hall Extension	"	7
Hotel Astor Addition	"	5
Germania Life Insurance Co.	"	5
Bankers Trust Company	"	11
East River Savings Institution	"	5
John T. Underwood	"	2
Postal Tel. Cable Company	"	6

1 : 1 GEARLESS TRACTION ELEVATORS

Building	Location	No. of Elevators
New York Edison Company	New York City	2
Fire Company's Building Corporation . .	"	12
Exchange Court Building	"	7
Aeolian Hall	"	5
Otis Elevator Company	"	2
Ritz-Carlton Hotel	"	1
Woolworth Building	"	26
Candler Building	"	4
Browning Building	"	3
New York Telephone Building	"	14
C. F. Colcord Building	Oklahoma City, Okla.	4
T. J. Keenan	Pittsburgh, Pa.	3
Estate of H. W. Oliver	"	15
H. C. Frick	"	3
First National Bank	"	6
Philadelphia Electric Company	Philadelphia, Pa.	1
Bailey, Banks & Biddle	"	2
Chestnut Street Realty Company	"	6
Curtis Publishing Company	"	7
Corbett Estate	Portland, Ore.	3
Yeon Building	"	3
Eastern Townships Bank	Quebec, Canada	3
First National Bank	Richmond, Va.	6
Whittel Building	San Francisco, Cal.	2
Humboldt Bank	"	4
Starr King Building	"	3
Alaska Com. Co.	"	3
Metropolis Bank	"	3
Royal Insurance Company	"	3
Hearst Building	"	4
Standard Oil Company	"	4
Savannah Bank & Trust Co.	Savannah, Ga.	3
A. Y. P. Exposition	Seattle, Wash.	1
L. C. Smith Building	"	8
Old National Bank	Spokane, Wash.	4
Syndicate Trust Company	St. Louis, Mo.	7
Third National Bank	"	6
Lilburn Realty Company	"	4
National Realty Company	Tacoma, Wash.	2
Dominick Burns	Vancouver, B. C.	3
Amicable Life Insurance Company	Waco, Texas	3
John Stambaugh	Youngstown, Ohio	3
Wickes Brothers Trust	"	2
Wick Building Company	"	1
Mahoning Nat. Bank	"	2

2:1 GEARLESS TRACTION ELEVATORS

Name of Building	Location	No. of Elevators
Columbia National Life Insurance Co. . .	Boston, Mass.	3
Rand-McNally & Company	Chicago, Ill.	5
Otis Elevator Co.	"	1
Rothschild Building	"	30
Goddard Building	"	3
Kesner Building	"	6
Y. M. C. A. Building	"	4
Westminster Building	"	5
Palmetto Bank	Columbia, S. C.	3
Guy Sumpter Building	Dallas, Texas	2
F. C. & G. G. Hubbel	Des Moines, Iowa	3
Murphy Building	East St. Louis, Ill.	2
Hotel Paso-del-Norte	El Paso, Texas	3
Cotton Building	Houston, Texas	1
Beatty Building	"	1
Heard National Bank	Jacksonville, Fla.	4
Bamberger Building	Newark, N. J.	17
42nd Street and Madison Ave. Co.	New York City	9
Realty Company	"	4
Yale & Towne Mfg. Co.	"	3
4th Ave. Company	"	3
Otis Elevator Company	"	1
Auerbach Candy Company	"	1
Speedwell Building (20th St. and B'way)	"	4
30th Street and 4th Avenue	"	3
Longacre Building	"	5
New York Times Building	"	4
New York Telephone Co.	"	2
Eagle Building	"	7
26th St. & 5th Ave. Bldg. Co.	"	4
Architects Building	"	6
Woodmen of The World	Omaha, Neb.	6
Turks Head Bldg.	Providence, R. I.	5
Times-Despatch Bldg.	Richmond, Va.	2
Richmond Hotel	"	4
Laclede Gas Company	St. Louis, Mo.	4
Railway Exchange Bldg.	"	19
Thomas Eaton Company	Winnipeg, Canada	3

DIRECTORY OF OFFICES

UNITED STATES

New York—Main Office: Eleventh Ave. and Twenty-sixth St.
Works: Yonkers, N. Y.
Works: Harrison, N. J.
Works: Buffalo, N. Y.
Chicago—Main Office: 600 West Jackson Boulevard.
Works: Chicago, Ill.
Works: Quincy, Ill.
St. Louis—Office: 300 Security Bldg.
Works: 8th and Mullanphy Sts.
Houston—Office and Works: German Street.
San Francisco—Office and Works: Stockton, North Point and Beach Streets.

BRANCHES—DOMESTIC

Albany, N. Y.—40 Beaver St.
Altoona, Pa.—1125½ 12th Ave.
Atlanta, Ga.—Kontz Building.
Atlantic City, N. J.—14 N. Presbyterian Avenue.
Augusta, Ga.—117 Montgomery Building.
Baltimore, Md.—Equitable Bldg.
Birmingham, Ala.—426 S. 20th St.
Boston, Mass.—34-35 India St.
Buffalo, N. Y.—Franklin and Huron Streets.
Charleston, W. Va.—19 Hale St.
Charleston, S. C.—7 State Street.
Charlotte, N. C.—209 N. College Street.
Chattanooga, Tenn.—819 Cherry Street.
Cincinnati, Ohio—1014 Mercantile Library Building.
Cleveland, Ohio—701-707 St. Clair Avenue, N.E.
Columbus, Ohio—230 N. Third Street.
Dallas, Texas—Young and Akard Streets.
Denver, Col.—1626-1628 Glenarm Street.
Des Moines, Iowa—209 Crocker Building.
Detroit, Mich.—5th and Fort Sts.
Duluth, Minn.—109 2nd Ave., W.
Erie, Pa.—1509 Sassafras St.
Fort Worth, Texas—Cotton Exchange Building.
Grand Rapids, Mich.—40 S. Ionia Street.
Harrisburg, Pa.—4 N. Fifth St.
Harrison, N. J.—First St.
Hartford, Conn.—Courant Bldg.
Honolulu, Hawaii—Von Hamm, Young & Co., Ltd., Alexander Young Building.
Indianapolis, Ind.—101-107 Kentucky Avenue.
Jacksonville, Fla.—Buckman Bldg.
Kansas City, Mo.—1920 Wyandotte Street.
Knoxville, Tenn.—424 Wall St.
Little Rock, Ark.—219 W. 3d St.
Los Angeles, Cal.—218-220 East Fourth Street.
Louisville, Ky.—206 W. Main St.
Lynchburg, Va.—109 Eighth St.
Macon, Ga.—Commercial National Bank Building.
Memphis, Tenn.—Third Street and Madison Avenue.
Milwaukee, Wis.—115-117 Huron Street.
Minneapolis, Minn.—415 South Fourth Street.
Mobile, Ala.—270 North Royal St.
Moline, Ill.—120 17th Street.
Montgomery, Ala.—First National Bank Building.
Nashville, Tenn.—148 6th Ave., N.

New Haven, Conn.—82 Church Street.
New Orleans, La.—852 Carondelet Street.
Norfolk, Va.—65 Fayette Street.
Oklahoma City, Okla.—213 West First Street.
Omaha, Neb.—1214 Howard St.
Philadelphia, Pa.—12th and Sansom Streets.
Pittsburgh, Pa.—Keenan Bldg.
Portland, Me.—495 Fore Street.
Portland, Ore.—88 First Street.
Providence, R. I.—218-222 South Main Street.
Reading, Pa.—420 Chestnut St.
Richmond, Va.—12 S. Tenth St.
Rochester, N. Y.—Frank and Commercial Streets.
St. Paul, Minn.—10 Endicott Building.
Salt Lake City, Utah—Judge Building.
San Antonio, Tex.—104 Yturri St.
San Diego, Cal.—1103 G St.
Savannah, Ga.—Germania National Bank Building.
Scranton, Pa.—217 Spruce St.
Seattle, Wash.—26 West Connecticut Street.
Spokane, Wash.—821 Paulsen Building.
Springfield, Mass.—356 Main St.
Syracuse, N. Y.—374 W. Fayette Street.
Tampa, Fla.—209 Krouse Street.
Toledo, Ohio—522 Jackson Ave.
Trenton, N. J.—821 Carteret Ave.
Utica, N. Y.—114 Arcade Bldg.
Waco, Texas—Times-Herald Bldg.
Washington, D. C.—Metropolitan Bank Building.
Wheeling, W. Va.—1311 Jacob Street.
Wilmington, Del.—215 Ford Bldg.
Worcester, Mass.—Central Exchange Building.
Youngstown, Ohio—Federal Bldg.

CANADA

Otis-Fensom Elevator Co., Ltd.—Main Office: Traders Bank Building, Toronto, Ontario.
Works: Victoria Avenue, Hamilton, Ontario.

BRANCHES

Montreal, P. Q.—368 St. James Street.
Calgary, Alta.—322 Ninth Ave., W.
Ottawa, Ont.—9 O'Connor Street.
Vancouver, B. C.—157 Water St.
Winnipeg, Manitoba—316 Cumberland Avenue.
Victoria, B. C.—526 Chancery Lane Avenue.
Edmonton—562 Second Street.

FOREIGN

Otis Elevator Company, Ltd.—Main Office: 4 Queen Victoria Street, London, England.
Birmingham, Eng. (Branch Office)
Bradford, Eng. " "
Brighton, Eng. " "
Glasgow, Scotland " "
Liverpool, Eng. " "
Manchester, Eng. " "
Newcastle, Eng. " "
Otis Elevator Gesellschaft, M.B.H., Berlin, Germany—Koniggratzerstrasse, 97.
Factory: Berlin—Wittenau.
Budapest, Austria—Hungary—V. Vecseyutca 3.

Brussels, Belgium—Compagnie Belge des Ascenseurs Otis, Chaussee d'Anvers.
Antwerp, Belgium—Compagnie Belge des Ascenseurs Otis.
Ostend, Belgium—Compagnie Belge des Ascenseurs Otis.
Amsterdam, Holland—Fred Steiltjes & Co., Keizirsgracht, No. 745.
Moscow, Russia—John Block Co.
Rustof D, Russia—John Block Company.
St. Petersburg, Russia—John Block Company.
Warsaw, Russia—Messrs. Chr Brun & Son, Agents.
Barcelona, Spain—Peninsula Engineering Co., Poate del Angelio
Madrid, Spain—S. Morris, Calle del Prado 10 Principal, Madrid.
Alexandria, Egypt—Egyptian Investment & Agency Co.
Cape Town, South Africa—R. M. Ross & Co., Strand Street.
Durban, South Africa—A. H. Johnson & Co., Ltd.
East London, South Africa—A. C. Maytham & Co., Hanover St.
Johannesburg, South Africa—A. H. Johnson & Co., Ltd., Adelaide Building.
Pt. Elizabeth, South Africa—A. H. Johnson & Co., Ltd.
Havana, Cuba—Sussdorff, Zaldo & Co., 36-38 O'Reilly Street.
Honolulu, Hawaii—Von Hamm, Young & Co., Ltd., Alexander Young Building.
Mexico City, Mexico—Enrique Schoendube, Apartado 756.
Newchwang, China—E. A. Sargent.
Shanghai, China—American Trading Company, 2 and 4 Hankow Road.
Tientsin, China—American Trading Company.
Calcutta, India—Martin & Co., 6 and 7 Clive Street.
Kobe, Japan—American Trading Company, No. 99.
Yokohama, Japan—American Trading Company, 28 Main St.
Bahia, Brazil—Guinle & Co., Rua Conselheiro Saraiva, 34.
Porto Alegre, Brazil—Lima & Martins, Caixa do Correio, No. 64, Estado do Rio Grande do Sul.
Rio do Janeiro, Brazil—Guinle & Co., Avenida Central, 107.
San Paulo, Brazil—Guinle & Co., Rua Deirerta, No. 7, P. O. Box Q.
Buenos Aires, Argentine—Buxton, Cassini & Co., Calle Suipacha Esq., Tucuman.
Rosario de Sante Fe—Buxton, Cassini & Company, San Lorenzo 1201, Esq. Mitre.
Santiago, Chile—Spencer & Waters, Casilla 627, or Pasaje Balma ceda No. 11.
Valparaiso, Chile—Spencer & Waters.
Australia—Main Office: George St., Sidney, J. B. Noeholson, Agent.
Adelaide, Australia. Branches.
Auckland, N. Z. " "
Christchurch, N. Z. " "
Dunedin, N. Z. " "
Melbourne, Australia " "
Perth, Australia " "
Wellington, N. Z. " "

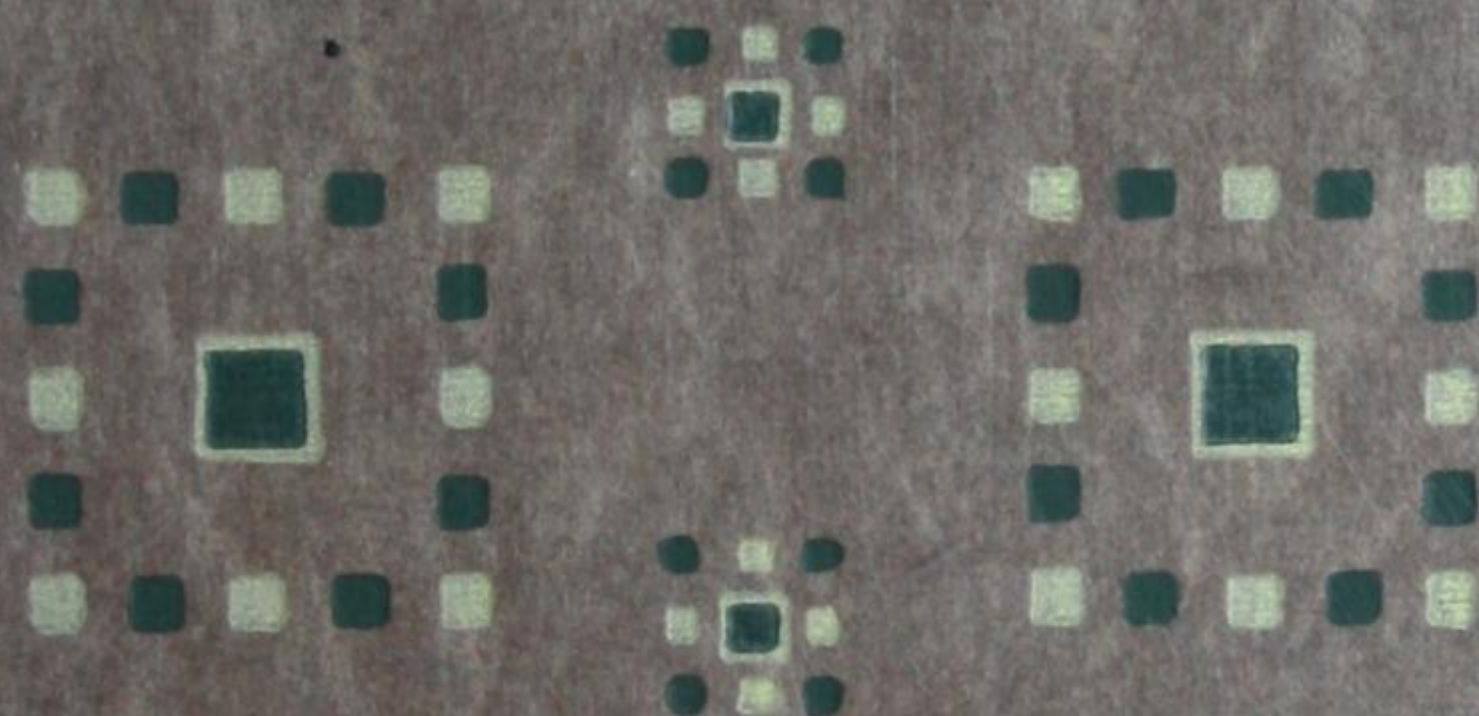




OTIS
ELEVATOR
COMPANY

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RESIDENCE
ELEVATORS





OTIS RESIDENCE ELEVATORS



OTIS
ELEVATOR COMPANY

OFFICES IN ALL THE PRINCIPAL CITIES
OF THE WORLD



Typical Entrance to an Otis Residence Elevator

THE OTIS AUTOMATIC RESIDENCE ELEVATOR



THE CONSTANTLY increasing demand for completeness in appointments of the modern private dwelling has evolved the perfection of a most ingenious piece of machinery known as the Otis Automatic Residence Elevator. This type of machine, as its name implies, is designed for use without a regular operator in attendance, its movements being controlled by its passengers or by those who desire its service, and who in general are entirely unfamiliar with the operation of elevators. For this reason it is most essential that every detail of the apparatus be absolutely reliable, that the installation be safe beyond any degree of doubt, and that it shall be so simple that even children may be their own operators without the slightest danger.

An installation consists of an electric motor-driven winding machine, a "controller" for closing and opening the main line circuits to the motor through electro-magnetic switches, and a "floor controller" whose duty it is to properly stop the elevator car at the desired floor. The car itself is made of hardwood or ornamental iron.

In order to meet the conditions imposed upon the automatic elevator, provision must be made for the following requirements: (1) That a person may step into the car, press a button, and be carried to the floor he desires without interference from any one in the halls who may want the car. (2) That a person may call the car, provided it is not in motion or occupied, to any floor on which he happens to be. (3) That all doors in the halls must be automatically locked while the car is in motion, and only after it has stopped at a landing can that door be opened. (4) That in an emergency the passenger may stop the car positively at any point and at any time.

At each floor there is a button similar in appearance to the ordinary call bell and is pressed momentarily by the person wishing the car. If unoccupied, it will start from whatever point it last stopped, come to the proper floor, stop and unlock the door. All the doors except the one opposite to which the car stops are automatically locked. This is accomplished by a patent door lock at each floor, whose operating lever projects slightly into the hatchway. A swinging cam mounted on the car engages this lever only when the car is at rest and opposite a floor, at which time the door may be opened. When the elevator is started the cam is swung clear of all the operating levers and remains so during the car's travel up or down the shaft. It will be seen that were this cam stationary it would momentarily unlatch each door as the car passed its lock, and should any

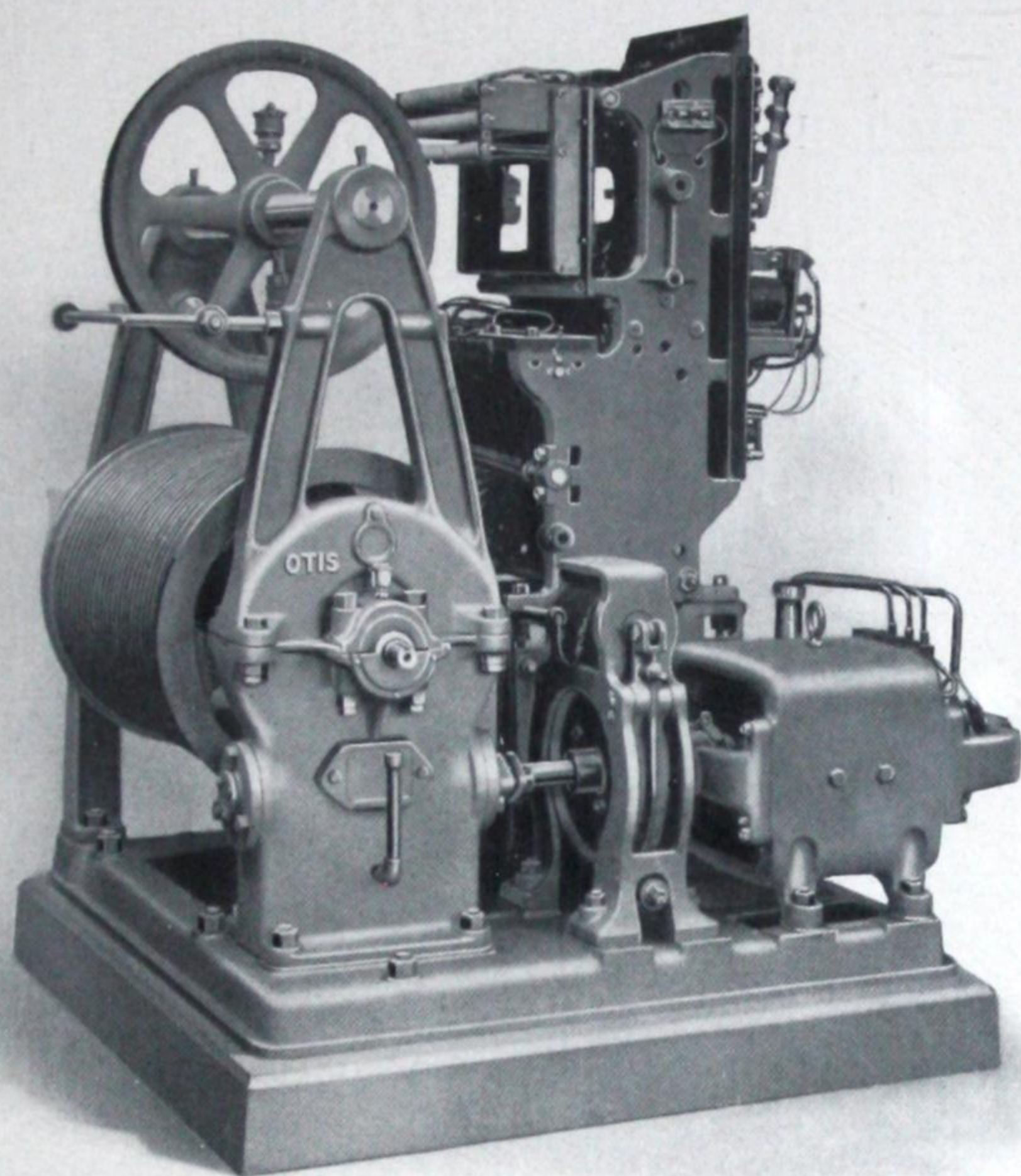


Design of Automatic Push-Button Elevator Car
For Private Residence

one be trying to open this particular door he would be able to do so. By the method employed, however, the danger of opening a door at a time when the car is in motion or not at the floor is entirely eliminated.

As an illustration of the safety and simplicity in operation of this type of elevator, we will assume that the car is at the ground floor and that a person wishes to ascend to the third floor.

The hall door, having been unlocked by the car, is opened, disclosing a handsomely finished and brilliantly lighted car of a size suitable for three or four people and equipped with a light folding gate of neat design. Opening this we step in and notice a bank of buttons mounted on a brass plate, conveniently located on the side of the car. These are connected by a traveling cable to the "controller." The buttons are lettered or numbered corresponding to the names or number of the floors, with an extra one marked "S," spaced slightly away from the others. The "S" button denotes "Stop" and will arrest the car immediately at any point in its travel, regardless of the previous pressing of any other button. Assuming that the passenger wishes to go to the third floor, he first closes the hall door, then the folding car gate and presses momentarily the button marked "3." If the door is locked and the gate securely closed, the car starts immediately, proceeds to the third floor and stops, during which time all interference from other floors is cut out. The car gate is opened and likewise the hall door when the passenger steps out,



Light Duty Direct Current Residence Elevator
Full Automatic Control

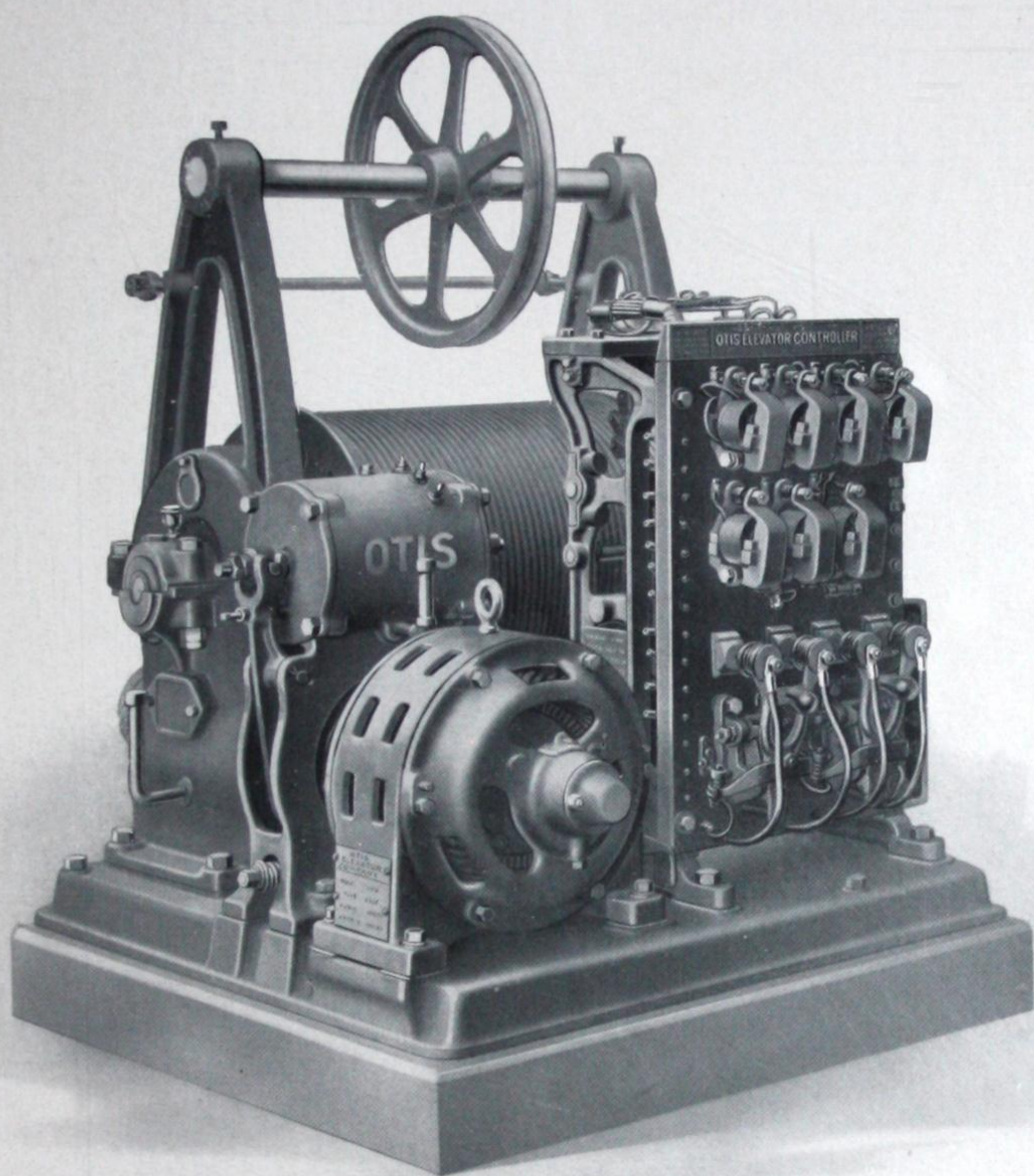
closing both after him, thus leaving the elevator ready for the next call.

Now we will assume that a person on the fifth floor desires its service. He simply presses momentarily the button at that floor and the elevator, if unoccupied, proceeds to that point. The hall doors have all been locked while the car was ascending, as has been explained, but now the fifth floor door may be opened. By so doing the elevator is again put in an inoperative condition until the passenger steps in and closes both door and car gate. He may then press a button for any floor he desires.

A feature of the "Stop" button which may not have been appreciated in the foregoing explanation is its use as a means of changing the original destination of the elevator. For example, a person may step in the car and press the fourth button with the intention of going to that floor, but having changed his mind or wishing to return, a pressure of the "Stop" button will immediately bring the car to rest and set all the magnets in their initial stop position, ready for another start. This has been found very convenient and is an especially appreciated feature.

The installations are well provided with automatic appliances which operate to produce an immediate stop if every part of the apparatus is not just as it should be.

A device known as a "slack cable" switch is provided which stops the car, when for any reason, the

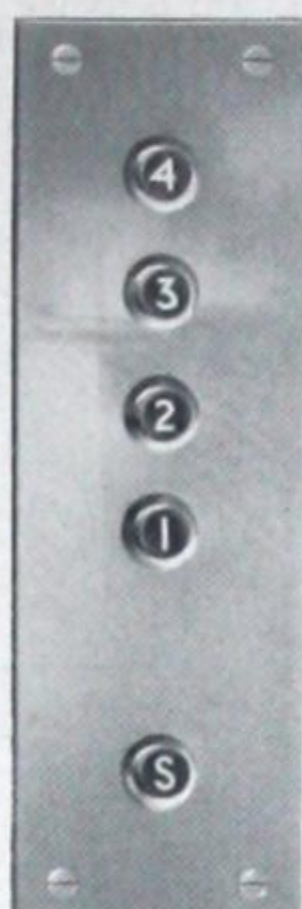
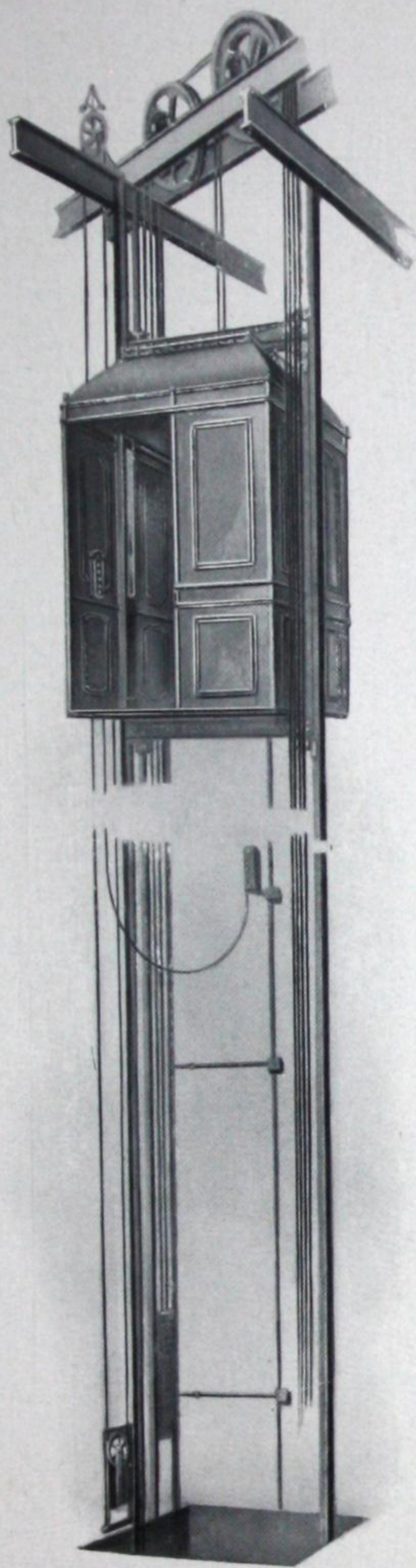


Light Duty Multiphase Alternating Current Residence Elevator
Full Automatic Control

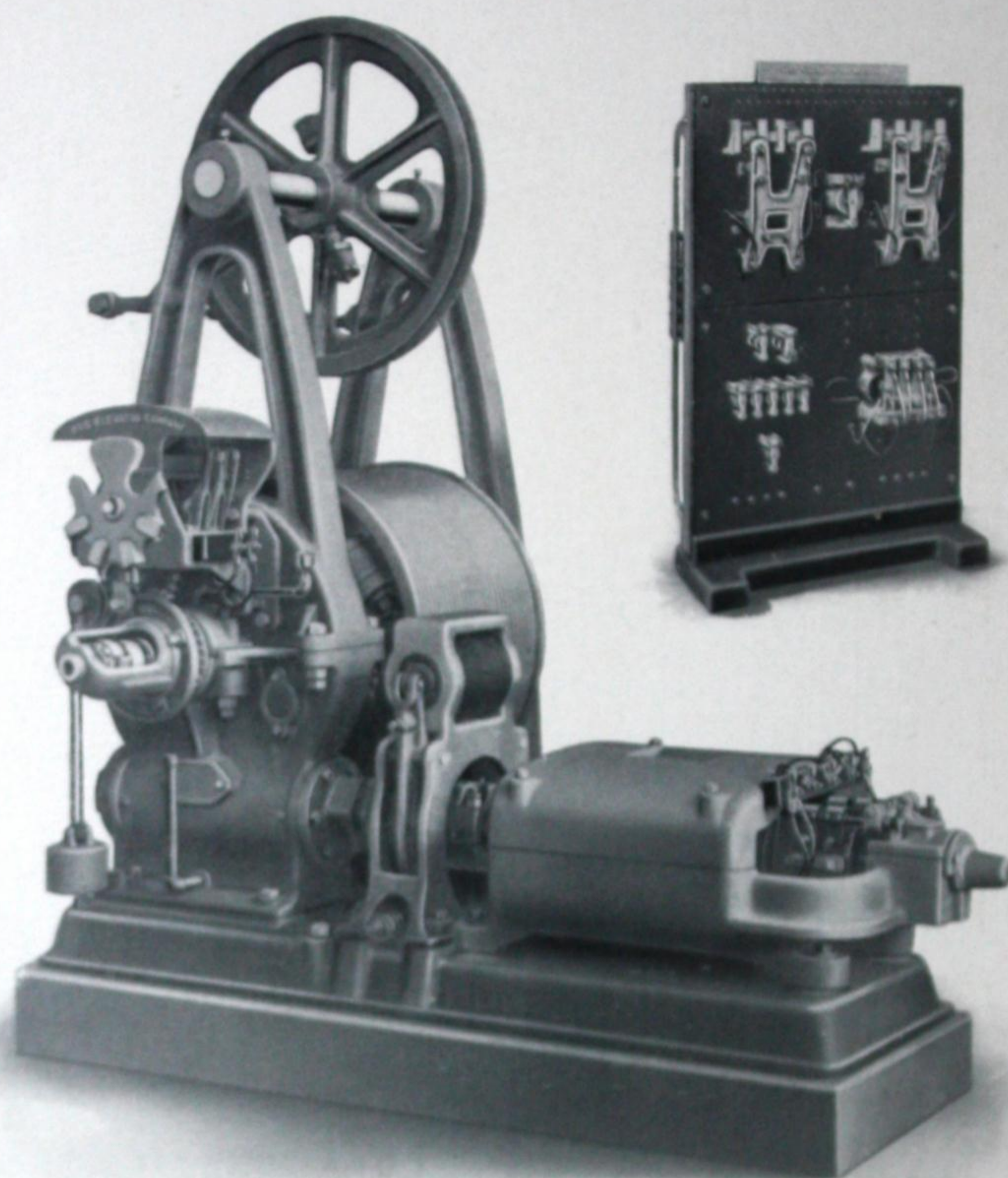
hoisting cables become slack. The operating circuits are also opened by "limit" switches, one being placed in the hatchway at each end of the travel and are engaged by a rigid angle iron cam mounted vertically along the side of the car. These switches are opened only when the car has gone from four to six inches beyond its normal limits of travel, and effect an immediate stop when operated.

The car itself is equipped with what is called a "safety plank," this being the main support of the car bottom and enclosure and embodies a device for clamping the guide rails in the event of the hoisting cables parting. In this way a gentle but positive stop is applied and prevents a fall to the bottom of the wellway.

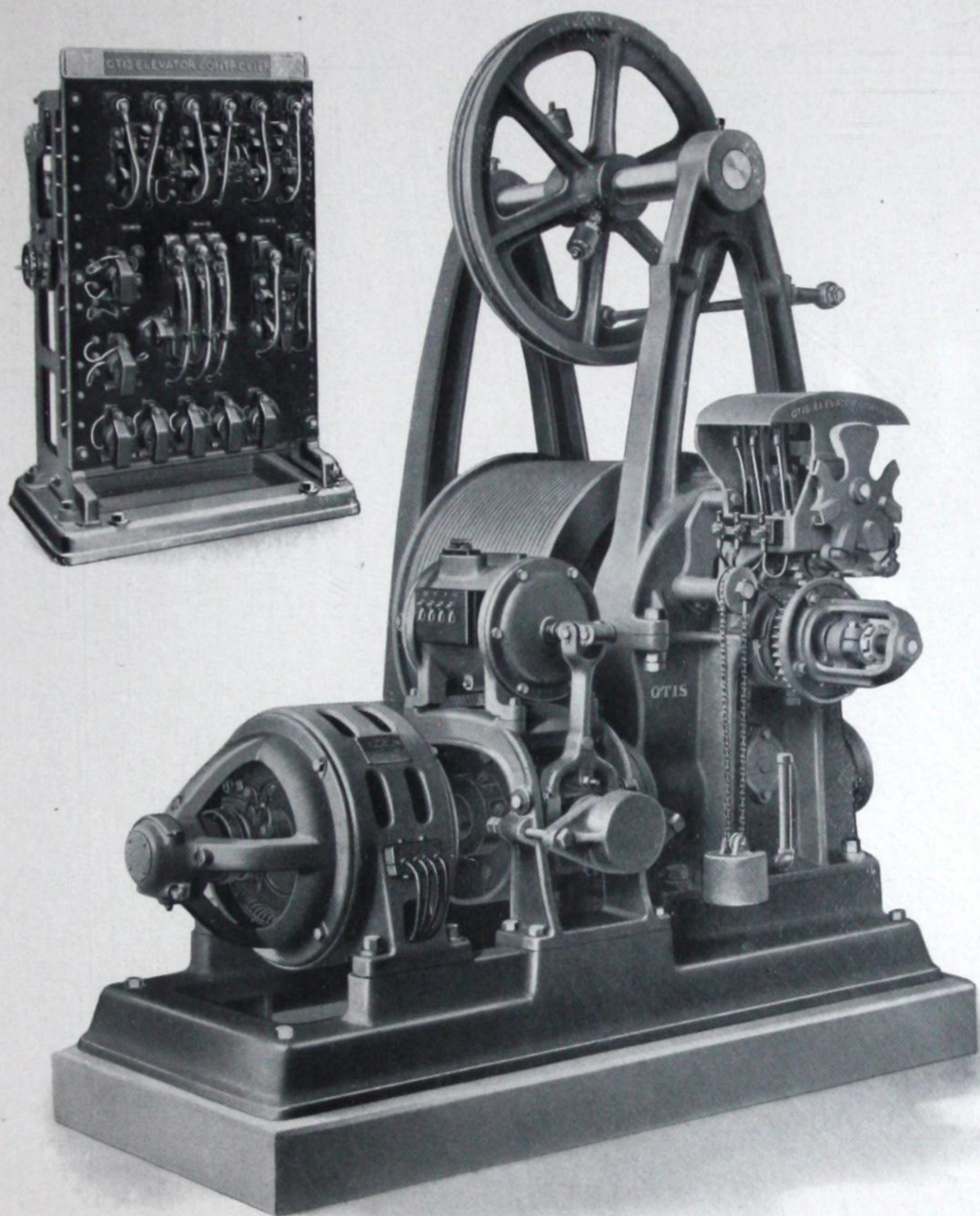
Although the requirements for this type of elevator may seem rather severe, they are amply met and with no great complication, as can readily be seen in any of our many installations. An actual test will prove to the most skeptical their great merit, absolute practicability, safety and simplicity.



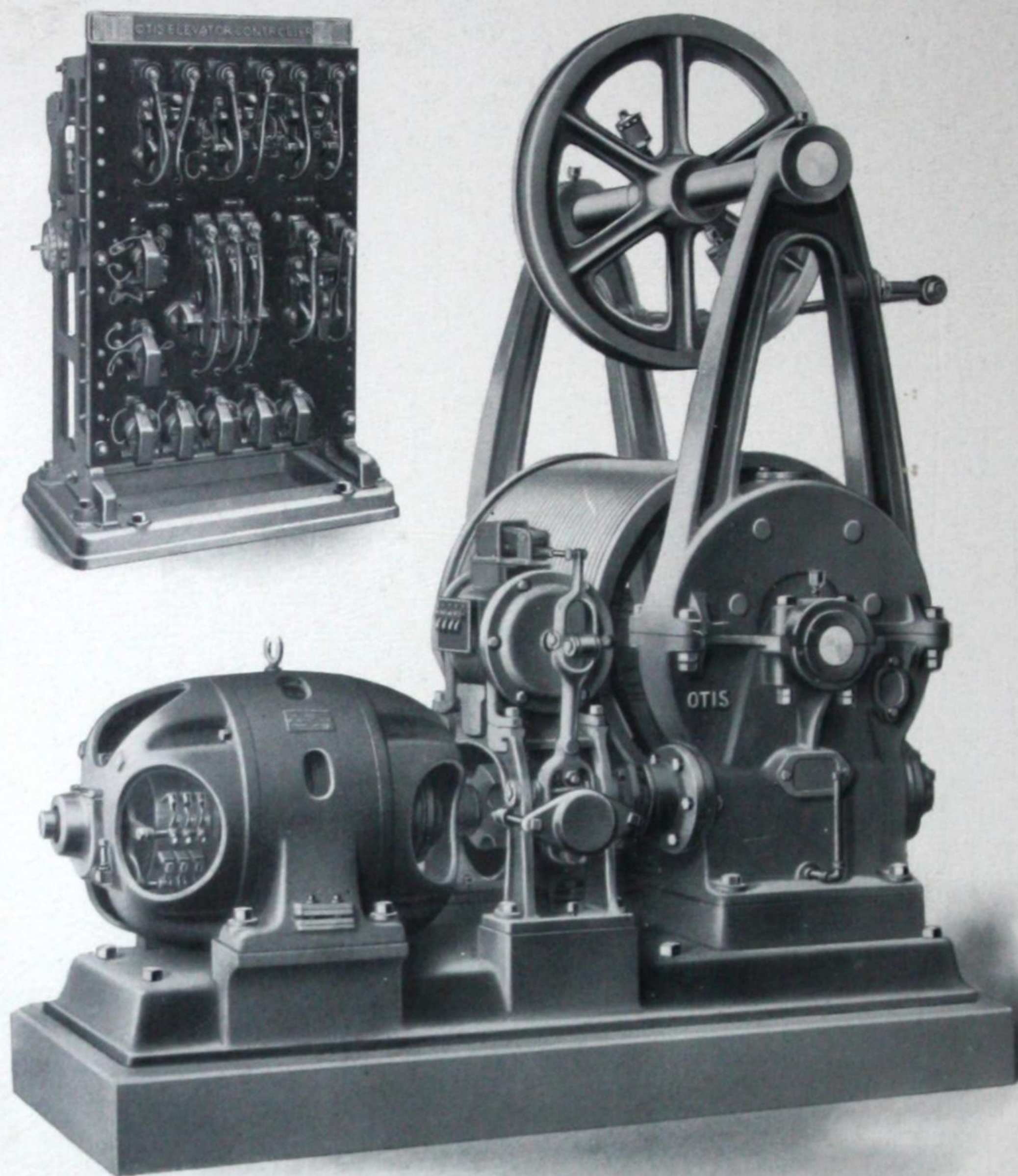
Otis Automatic Push-Button
Residence Elevator shown in
hatchway and the Bank of
Push-Buttons by means of
which the car is sent to any
desired landing.



Heavy Duty Direct Current Residence Elevator
Full Automatic Control



Heavy Duty Alternating Current Residence Elevator
Full Automatic Control



Light Duty Single Phase Alternating Current Residence Elevator
Full Automatic Control

Below will be found a partial list of our patrons.
Over one thousand elevators of this type have already
been installed throughout the world.

Mrs. M. Y. Myers, Albany, N. Y.
Waldo Newcombe, Baltimore, Md.
Wm. Fahnestock, Bedford, N. Y.
Union Club, Berlin, Germany
La Duchesse d'Arenberg, Brussels, Belgium
Comte A. de Ribeaucourt, Brussels, Belgium
Signor G. de Alzaga, Buenos Aires, Argentine
George L. Williams, Buffalo, N. Y.
Government House, Calcutta, India
F. G. Waller, Delft, Holland
Sir J. Liege Hulett, Durban, South Africa
J. R. DeLamar, Glen Cove, L. I.
J. P. Morgan, Jr., Glen Cove, L. I.
E. H. Hooker, Greenwich, Conn.
James B. Haggin, Lexington, Ky.
D. Vicente de Yravedra, Madrid, Spain
A. Baumgarten, Montreal, P. Q.
E. J. Berwind, Newport, R. I.
Isaac V. Brokaw, New York City
W. Lanman Bull, New York City
Andrew Carnegie, New York City
J. D. Crimmins, New York City
Stuyvesant Fish, New York City
Louis Fleischmann, New York City
John H. Hammond, New York City
Adolph Lewisohn, New York City
W. W. McAlpin, New York City
J. P. Morgan, New York City
H. S. Redmond, New York City
Hon. Whitelaw Reid, New York City
William Rockefeller, New York City
Henry Seligman, New York City
Mrs. W. D. Sloane, New York City
Isaac Stern, New York City
Mortimer L. Schiff, New York City
Seth Low, New York City
H. McK. Twombly, New York City
Mrs. Vanderbilt, New York City
W. K. Vanderbilt, Jr., New York City
Dr. J. W. McLane, New York City

Wm. W. Astor, New York City
E. H. Gary, New York City
Helen M. Gould, New York City
Mrs. Ogden Goelet, New York City
Mrs. Anna DeKoven, New York City
Mrs. N. F. Palmer, New York City
H. H. Rogers, New York City
E. W. Sheldon, New York City
Percy Remington Pyne, New York City
J. B. Duke, New York City
J. Harper Poor, New York City
Mrs. Chas. Lane Poor, New York City
Burton Chapin, New York City
Ferdinand Kurzeman, New York City
Col. W. L. Elkins, Ogontz, Pa.
King Leopold, Royal Residence, Ostend, Belgium
Comte de Greffule, Paris, France
M. de Villeroy, Paris, France
George A. Huhn, Philadelphia, Pa.
Acorn Club, Philadelphia, Pa.
Mrs. Alice Nash Burke, Philadelphia, Pa.
John D. Rockefeller, Pocantico Hills, N.Y.
Vassar College, Poughkeepsie, N. Y.
Warwick House, St. James, London
E. F. Ruling, St. Petersburg, Russia
Spreckels Residence, San Francisco, Cal.
J. L. Hood, San Francisco, Cal.
Senor Espinola, Santiago, Chile
Senor A. Lyon-Pena, Santiago, Chile
Joseph O. Hobbs, Somerville, Mass.
M. Anderson, Stockholm, Sweden
Ferdinand D. Roebling, Trenton, N. J.
Hon. N. W. Aldrich, Warich, R. I.
L. Potoski, Warsaw, Poland
Mrs. L. Z. Leiter, Washington, D. C.
Atty. Gen. Wickersham, Washington, D.C.
Perry Belmont, Washington, D. C.
Gen. Anson Mills, Washington, D. C.
Mrs. I. W. B. Moran, Washington, D. C.
Mme. Christian Hauge, Washington, D.C.
U. S. Military Academy, West Point, N.Y.

DIRECTORY OF OFFICES

UNITED STATES

New York—Main Office: 17 Battery Place.
 Works: Yonkers, N. Y.
 Works: Harrison, N. J.
 Works: Buffalo, N. Y.
 Chicago—Main Office: 80 East Jackson Boulevard.
 Repair and Supply Department: 213-221 W. Michigan Street.
 Works: Chicago, Ill.
 Works: Moline, Ill.
 Works: Peru, Ind.
 Works: Quincy, Ill.
 St. Louis—Office: Security Building.
 Works: 8th and Mullanphy Sts.
 Houston—Office and Works: German Street.
 San Francisco—Office and Works: Stockton, North Point and Beach Streets.

BRANCHES—DOMESTIC

Albany, N. Y.—310 Broadway.
 Atlanta, Ga.—84½ Marietta Street.
 Atlantic City, N. J.—14 North *Presbyterian Avenue.
 Baltimore, Md.—Equitable Bldg.
 Birmingham, Ala.—Brown - Marx Building.
 Boston, Mass.—34-35 India Street.
 Buffalo, N. Y.—Franklin and Huron Streets.
 Charleston, W. Va.—903 Kanawha Street.
 Charlotte, N. C.—209 N. College St.
 Chattanooga, Tenn.—16 W. 7th St.
 Cincinnati, Ohio—1014 Mercantile Library Building.
 Cleveland, Ohio—701-707 St. Clair Avenue, N. E.
 Columbus, Ohio—230 North Third Street.
 Dallas, Texas—Young and Akard Streets.
 Denver, Col.—1609-1611 Glenarm Street.
 Des Moines, Iowa—209 Crocker Building.
 Detroit, Mich.—Fifth and Fort Sts.
 Duluth, Minn.—1919 Jefferson St.
 Erie, Pa.—1509 Sassafra Street.
 Fort Worth, Texas—1022 Monroe St.
 Grand Rapids, Mich.—40 South Ionia Street.
 Harrisburg, Pa.—226 Boas Street.
 Hartford, Conn.—Courant Bldg.
 Indianapolis, Ind.—101-107 Kentucky Avenue.
 Jacksonville, Fla.—Buckman Bldg.
 Kansas City, Mo.—R. A. Long Building.
 Little Rock, Ark.—219 West 3d St.
 Los Angeles, Cal.—218-220 East Fourth Street.
 Louisville, Ky.—Lincoln Bank Building.
 Macon, Ga.—Commercial National Bank Building.
 Memphis, Tenn.—Third Street and Madison Avenue.
 Milwaukee, Wis.—144 West Water Street.
 Minneapolis, Minn.—415 South Fourth Street.
 Mobile, Ala.—269 St. Michaels St.
 Montgomery, Ala.—First National Bank Building.

New Haven, Conn.—32 Church Street.
 New Orleans, La.—852 Carondelet Street.
 Norfolk, Va.—Board of Trade Bldg.
 Oklahoma City, Okla.—904 Colcord Building.
 Omaha, Neb.—1214 Howard St.
 Philadelphia, Pa.—12th and Sansom Streets.
 Pittsburgh, Pa.—Keenan Building.
 Portland, Me.—495 Fore Street.
 Portland, Ore.—88 First Street.
 Providence, R. I.—218-222 South Main Street.
 Reading, Pa.—420 Chestnut Street.
 Richmond, Va.—12 South Tenth St.
 Rochester, N. Y.—Frank and Commercial Streets.
 Saint Paul, Minn.—10 Endicott Building.
 Salt Lake City, Utah—Judge Bldg.
 San Antonio, Texas—104 Yturri St.
 Savannah, Ga.—Germania National Bank Building.
 Scranton, Pa.—217 Spruce Street.
 Seattle, Wash.—26 West Connecticut Street.
 Spokane, Wash.—821 Paulsen Bldg.
 Springfield, Mass.—224 Worthington Street.
 Syracuse, N. Y.—374 West Fayette Street.
 Tampa, Fla.—209 Krouse Street.
 Toledo, Ohio—522 Jackson Avenue.
 Trenton, N. J.—821 Carteret Ave.
 Utica, N. Y.—52 Liberty Street.
 Washington, D. C.—Metropolitan Bank Building.
 Wheeling, W. Va.—1311 Jacob St.
 Wilmington, Del.—1102 West 4th Street.
 Worcester, Mass.—Central Exchange Building.
 Youngstown, Ohio—Federal Bldg.

CANADA

Otis-Fensom Elevator Co., Ltd.:
 Main Office: Traders Bank Building, Toronto, Ont.
 Works: Victoria Avenue, Hamilton, Ont.
 Montreal, P. Q.—Roy and St. James Streets.
 Ottawa, Ont.—O'Connor Street.
 Vancouver, B. C.—156 Alexander Street.
 Winnipeg, Manitoba—316 Cumberland Avenue.
 Edmonton—562 Second Street.

FOREIGN

Otis Elevator Company, Ltd.—
 Main Office: 4 Queen Victoria Street, London, England.
 Birmingham, Eng. (Branch Office).
 Bradford, Eng. "
 Brighton, Eng. "
 Glasgow, Scotland "
 Liverpool, Eng. "
 Manchester, Eng. "
 Newcastle, Eng. "
 Otis Elevator Gesellschaft, Berlin, Germany — Koniggratzerstrasse, 97-9.

Brussels, Belgium — Compagnie Belge des Ascenseurs Otis, Chaussee d'Anvers.
 Antwerp, Belgium — Compagnie Belge des Ascenseurs Otis.
 Ostend, Belgium—Compagnie Belge des Ascenseurs Otis.
 Amsterdam, Holland—Fred Steiltjes & Co., Keizirgracht, No. 745.
 Moscow, Russia—John Block Company.
 Rustof D, Russia — John Block Company.
 St Petersburg, Russia—John Block Company.
 Warsaw, Russia—Messrs. Chr. Brun & Son, Agents.
 Barcelona, Spain—Hastings, Roberts & Co., 644 Calle de las Cortes.
 Madrid, Spain—S. Morris, Calle del Prado 10 Principal, Madrid.
 Alexandria, Egypt—Egyptian Investment & Agency Co.
 Cape Town, South Africa—R. M. Ross & Co., Strand Street.
 Durban, South Africa—A. H. Johnson & Co., Ltd.
 East London, South Africa—A. C. Maytham & Co., Hanover Street.
 Johannesburg, South Africa—A. H. Johnson & Co., Ltd., Adelaide Building.
 Pt. Elizabeth, South Africa—A. H. Johnson & Co., Ltd.
 Havana, Cuba—Sussdorff, Zaldo & Co., 26-36 O'Reilly Street.
 Honolulu, Hawaii—Von Hamm, Young & Co., Ltd., Alexander Young Building.
 Mexico City, Mex.—Enrique Schoendube, Apartado 756.
 Newchwang, China—E. A. Sargent.
 Shanghai, China—American Trading Company, 2 and 4 Hankow Road.
 Tientsin, China—American Trading Company.
 Calcutta, India—Martin & Co., 6 and 7 Clive Street.
 Kobe, Japan—American Trading Company, No. 99.
 Yokohama, Japan—American Trading Company, 28 Main Street.
 Bahia, Brazil—Guinle & Co., Rua Conselheiro Saraiva, 34.
 Porto Alegre, Brazil—Lima & Martins, Caixa do Correio, No. 64, Estado do Rio Grande do Sul.
 Rio di Janeiro, Brazil—Guinle & Co., Avenida Central, 107.
 San Paulo, Brazil—Guinle & Co., Rua Deirerta, No. 7, P. O. Box Q.
 Buenos Ayres, Argentine—Buxton Cassini & Co., Calle Suipacha Esq., Tucuman.
 Santiago, Chili—Spencer & Waters, Casilla 627, or Pasaje Balmaceda No. 11.
 Valparaiso, Chili—Spencer & Waters.
 Australia—Main Office: George St., Sidney, J. B. Nicholson, Agent.
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 Dunedin, N. Z. "
 Melbourne, Australia. "
 Perth, Australia. "
 Wellington, N. Z. "





OTIS HAND POWER ELEVATORS

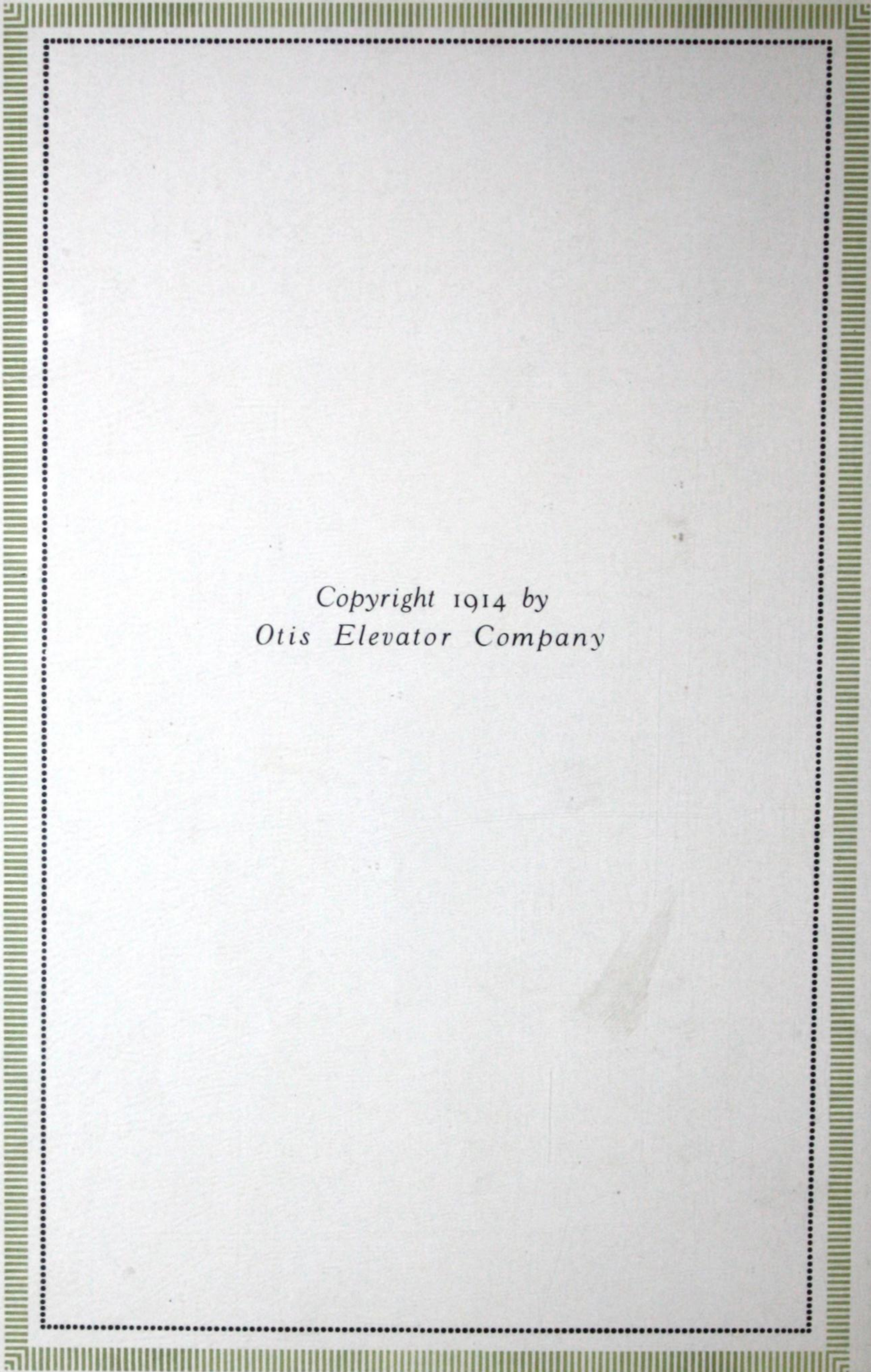


OTIS
ELEVATOR
COMPANY

OFFICES IN ALL PRINCIPAL CITIES
OF THE WORLD



OTIS
HAND POWER
ELEVATORS

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*Copyright 1914 by
Otis Elevator Company*

OTIS HAND POWER ELEVATORS



OTIS
ELEVATOR COMPANY

OFFICES IN ALL PRINCIPAL CITIES
OF THE WORLD

THE simplicity of all *Otis Hand Power Elevators* makes their erection easy and economical.

The working drawings and instructions furnished with the equipment are so simple and complete that anyone at all mechanically inclined will experience no difficulty in erecting.

INTRODUCTION



It has been an aim of the Otis Elevator Company for many years to produce the highest grade of Hand Power Elevators at a cost low enough to place these machines within the means of everyone whose business demands a hoist of this type.

In submitting the several different types of Hand Power Apparatus shown in this catalog, we wish to call particular attention to the *Steel Construction* which is the Otis Standard and is explained in detail on the following pages.

STANDARD SIZES

ONE of the first questions which confronts a prospective elevator purchaser is the size of platform needed to meet his requirements. This can be determined by consulting our list of "*Standard Sizes*," and arranging a hatchway to suit the selected platform.

Standard Size platforms are manufactured in large quantities and placed in stock, thereby reducing the cost of production to a minimum. This not only gives the purchaser the benefit of a lower cost, but secures for him the advantage of immediate shipment.

Use the Standard sizes in all cases when it is possible and secure the advantages mentioned above.

Special sizes at advanced prices.

LIST OF STANDARD SIZES

No. 1 Center Lift

PLATFORM			HATCHWAY		
Postwise	Front to Back		Postwise	Front to Back	
3' 0"	x	3' 0"	4' 1"	x	3' 2"
4' 0"	x	4' 0"	5' 1"	x	4' 2"
4' 0"	x	5' 0"	5' 1"	x	5' 2"

No. 4A

4' 0"	x	4' 0"	5' 1 $\frac{1}{2}$ "	x	4' 2"
4' 0"	x	5' 0"	5' 1 $\frac{1}{2}$ "	x	5' 2"
4' 0"	x	6' 0"	5' 1 $\frac{1}{2}$ "	x	6' 2"
5' 0"	x	5' 0"	6' 1 $\frac{1}{2}$ "	x	5' 2"
5' 0"	x	6' 0"	6' 1 $\frac{1}{2}$ "	x	6' 2"
5' 0"	x	7' 0"	6' 1 $\frac{1}{2}$ "	x	7' 2"
6' 0"	x	6' 0"	7' 1 $\frac{1}{2}$ "	x	6' 2"
6' 0"	x	7' 0"	7' 1 $\frac{1}{2}$ "	x	7' 2"
6' 0"	x	8' 0"	7' 1 $\frac{1}{2}$ "	x	8' 2"
7' 0"	x	7' 0"	8' 1 $\frac{1}{2}$ "	x	7' 2"

No. 2 Center Lift

4' 0"	x	5' 0"	5' 1"	x	5' 2"
4' 0"	x	6' 0"	5' 1"	x	6' 2"
5' 0"	x	5' 0"	6' 1"	x	5' 2"
5' 0"	x	6' 0"	6' 1"	x	6' 2"
5' 0"	x	7' 0"	6' 1"	x	7' 2"
6' 0"	x	6' 0"	7' 1"	x	6' 2"
6' 0"	x	7' 0"	7' 1"	x	7' 2"
7' 0"	x	7' 0"	8' 1"	x	7' 2"

No. 1 Carriage Elevator

6' 0"	x	12' 0"	7' 0"	x	12' 3"
6' 0"	x	14' 0"	7' 0"	x	14' 3"
7' 0"	x	14' 0"	8' 0"	x	14' 3"

No. 2 Carriage Elevator

6' 0"	x	12' 0"	7' 0 $\frac{1}{2}$ "	x	12' 3"
6' 0"	x	14' 0"	7' 0 $\frac{1}{2}$ "	x	14' 3"
7' 0"	x	14' 0"	8' 0 $\frac{1}{2}$ "	x	14' 3"
7' 0"	x	16' 0"	8' 0 $\frac{1}{2}$ "	x	16' 3"
8' 0"	x	16' 0"	9' 0 $\frac{1}{2}$ "	x	16' 3"
8' 0"	x	18' 0"	9' 0 $\frac{1}{2}$ "	x	18' 3"

No. 3 Carriage Elevator

8' 0"	x	16' 0"	9' 0 $\frac{3}{4}$ "	x	16' 3"
8' 0"	x	18' 0"	9' 0 $\frac{3}{4}$ "	x	18' 3"
8' 0"	x	20' 0"	9' 0 $\frac{3}{4}$ "	x	20' 3"
9' 0"	x	18' 0"	10' 0 $\frac{3}{4}$ "	x	18' 3"

No. 1 Basement Elevator

3' 0"	x	4' 0"
4' 0"	x	4' 0"
5' 0"	x	4' 0"
6' 0"	x	4' 0"
7' 0"	x	5' 0"

As these sizes vary with local conditions, this information will be furnished on application.

No. 2 Basement Elevator

3' 0"	x	4' 0"
4' 0"	x	4' 0"
5' 0"	x	4' 0"
6' 0"	x	4' 0"
7' 0"	x	5' 0"

As these sizes vary with local conditions, this information will be furnished on application.

NO. 1 CENTER LIFT
HAND POWER ELEVATOR

THE NO. 1 Hand Power is especially adapted for light loads and small platform sizes. The rope or pull wheel may be placed at either the front or at the side, thus making it possible to install this type in either an open or enclosed hatchway.

We strongly recommend the sidepost arrangement shown in illustration. When conditions are such that the guide posts must be placed in the corners of hatchway, we can furnish special construction, for which drawings are necessary in each case to show size of hatchway required.

Special attention is called to the Steel Frame Platform and "Power" Type Safety Device furnished with all Otis Hand Power Elevators. These features differ slightly on the various types as conditions demand.

Specifications for the above are as follows:

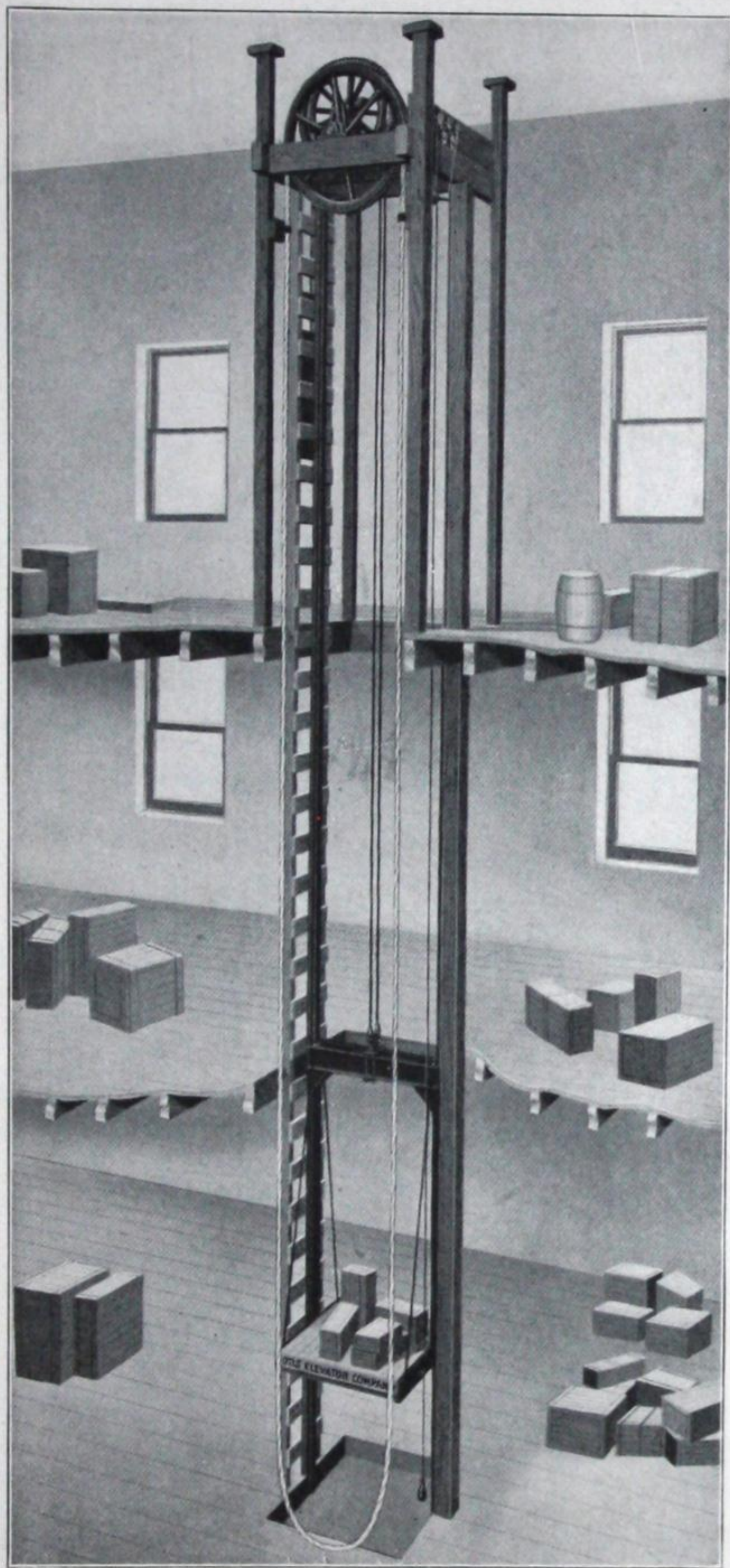
Lifting Machine	Platform—Steel Frame
Rope or Pull Wheel	Safety Device
Gearing and Shafts	Guide Strips
Hoisting Sheave	Maple
Roller Bearings	Ropes
Steel Band Brake	Two $\frac{1}{2}$ " Iron Lifting Cables
Overhead Frame	One $1\frac{1}{8}$ " Manila Hand Rope
Counterweights	One $\frac{1}{2}$ " Brake Rope
Adjustable	

We furnish complete drawings and instructions for erecting.

H A N D P O W E R E L E V A T O R S

NO. 1 CENTER LIFT HAND POWER ELEVATOR

Capacities 500 and 1000 lbs.



STANDARD SIZES

Postwise Front to Back	Postwise Front to Back	Postwise Front to Back
3' 0" x 3' 0"	4' 0" x 4' 0"	4' 0" x 5' 0"

NO. 4-A

HAND POWER ELEVATOR

THE No. 4-A is the most popular type and well deserves the great popularity which it has attained, being within its range, the best and most economical Hand Power Elevator ever built for the handling of general merchandise. It is simplicity itself to erect (another economical feature) and its easy running qualities and durable construction have met with ever growing favor.

It is not adapted for an enclosed hatchway, corner guides, nor for pull wheel in front.

If you wish to know how little money will purchase a high class Hand Power Elevator, write for prices of the No. 4-A.

Specifications for the above are as follows:

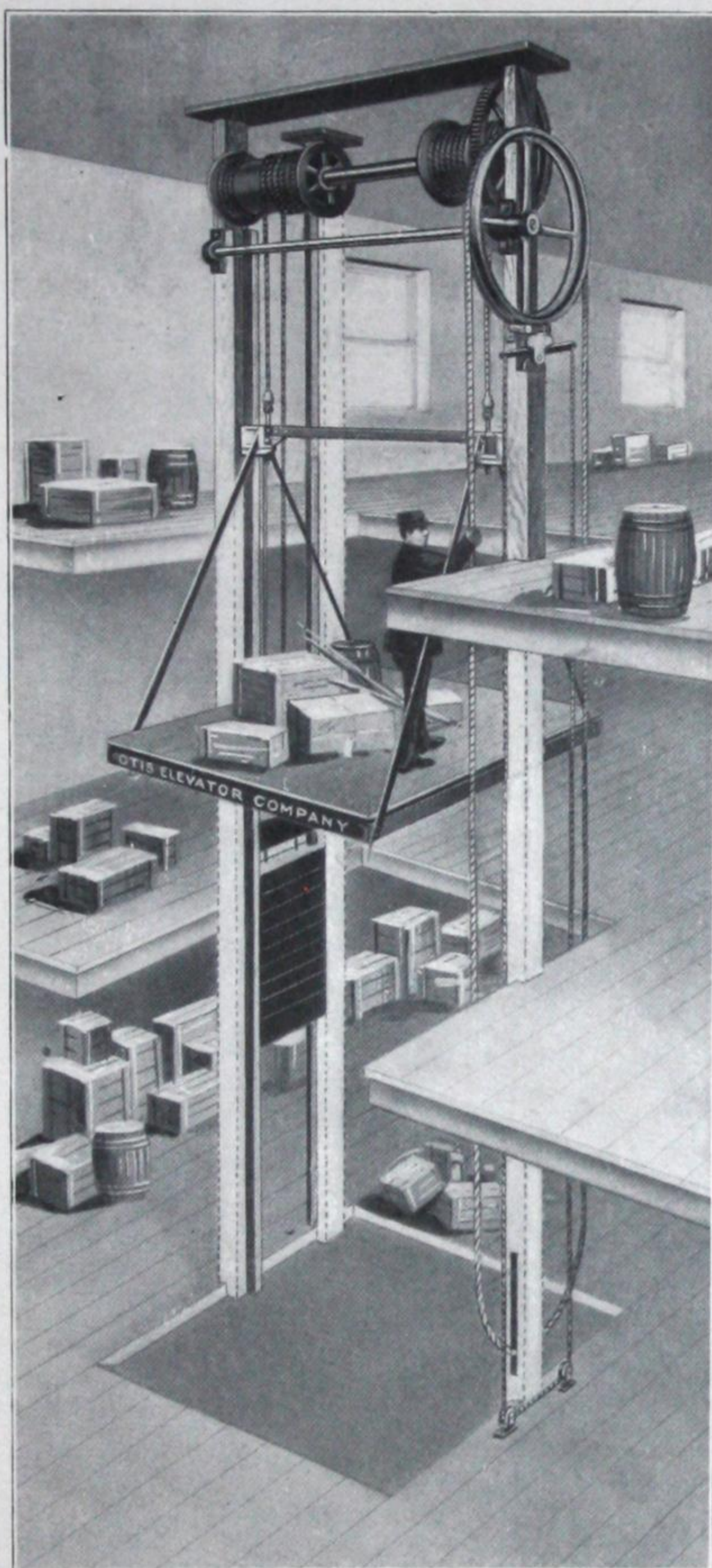
Winding Machine	Platform—Steel Frame
Rope or Pull Wheel	Safety Device
Shafts and Gearing	Guide Strips
Iron Drums	Maple
Roller Bearings	Ropes
Brake	Two $\frac{1}{2}$ " Iron Lifting Cables
Supports for Winding	One $\frac{1}{2}$ " Iron Weight Cable
Machine	One $1\frac{1}{8}$ " Manila Hand Rope
Counterweights	One $\frac{1}{2}$ " Brake Rope
Adjustable	

We furnish complete drawings and instructions for erecting.

H A N D P O W E R E L E V A T O R S

NO. 4-A HAND POWER ELEVATOR

Capacities 1500, 2000, 2500 lbs:



STANDARD SIZES

Postwise	Front to Back	Postwise	Front to Back	Postwise	Front to Back
4' 0"	x 4' 0"	5' 0"	x 5' 0"	6' 0"	x 7' 0"
4' 0"	x 5' 0"	5' 0"	x 6' 0"	6' 0"	x 8' 0"
4' 0"	x 6' 0"	5' 0"	x 7' 0"	7' 0"	x 7' 0"
		6' 0"	x 6' 0"		

SOME DETAILS

I N order to prove the Otis claim of superiority and in line with the policy of furnishing "The maximum value for a dollar" we show herewith cuts of the various parts which clearly illustrate in detail, the design, workmanship and method of constructing Otis Standard Hand Power Elevators.



Figure 1. 4-A Platform

PLATFORM

ALIVE to the fact that platforms made of wood do not always give the best satisfaction, we have designed a *Steel Frame Car* (Figure 1) with no wood used in this construction except for the flooring.

Further, this car is equipped with a type of safety similar to that used on Electric and other "Power" Elevators, thus making a much more effective device than the old style of Beam Spring Safety.

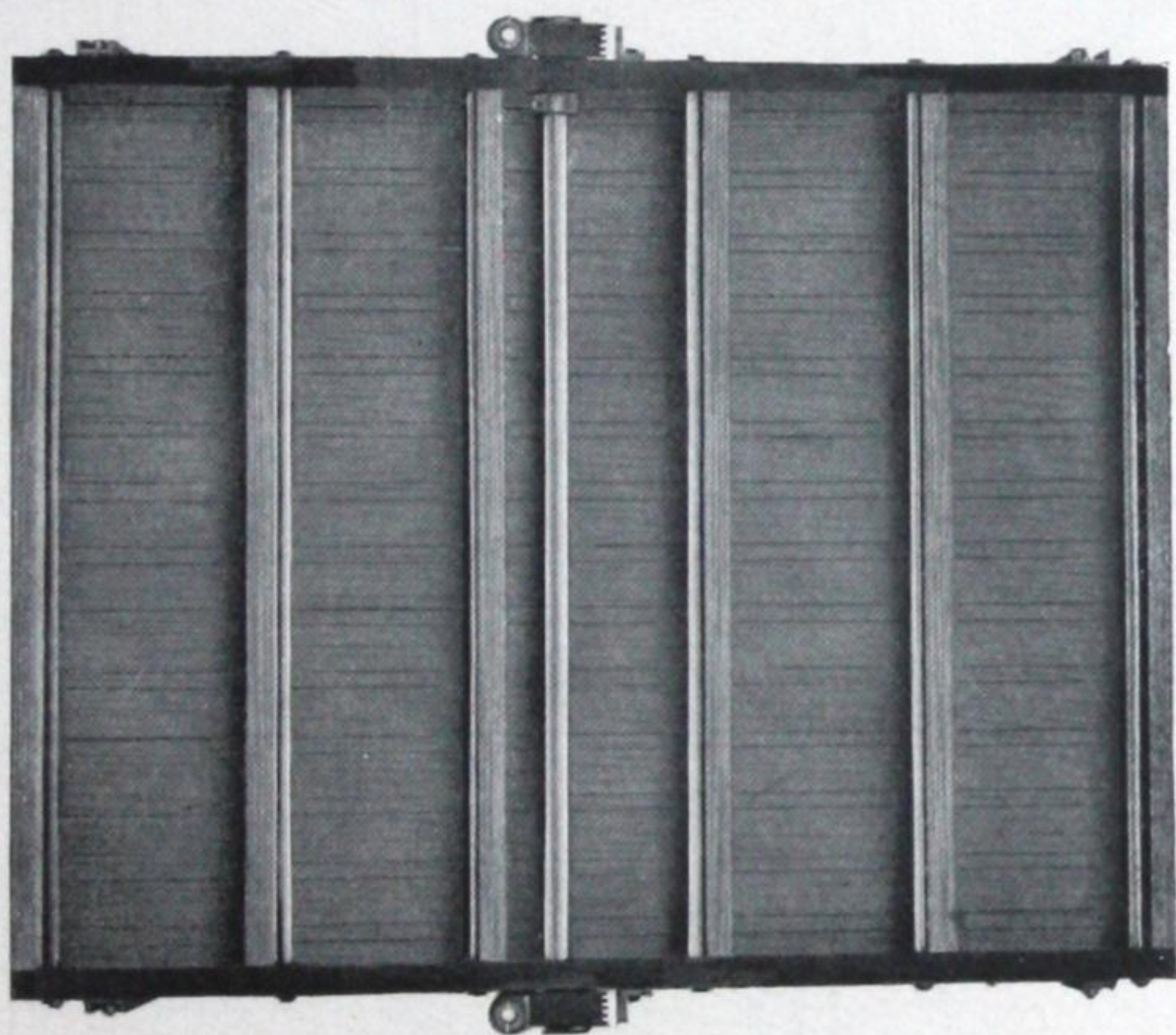


Figure 2. Bottom View of Platform

In Figure 2 a bottom view of the platform is shown, giving a clear idea of the safety dogs, the method of bracing, and the strong construction.

GUIDE POST AND STRIPS

OWING to the fact that guide post stock can be obtained from any lumber yard, the customer often prefers to purchase his posts locally and save the freight charges.

A solid post of proper size can be used, but we strongly recommend the use of a compound post as shown in Figure 3, in order to eliminate warping and twisting. Although the cost of this post is greater than the old style solid one, we furnish compound posts in all cases, when posts are ordered, thus assuring the purchaser of absolutely true runways for his platform.

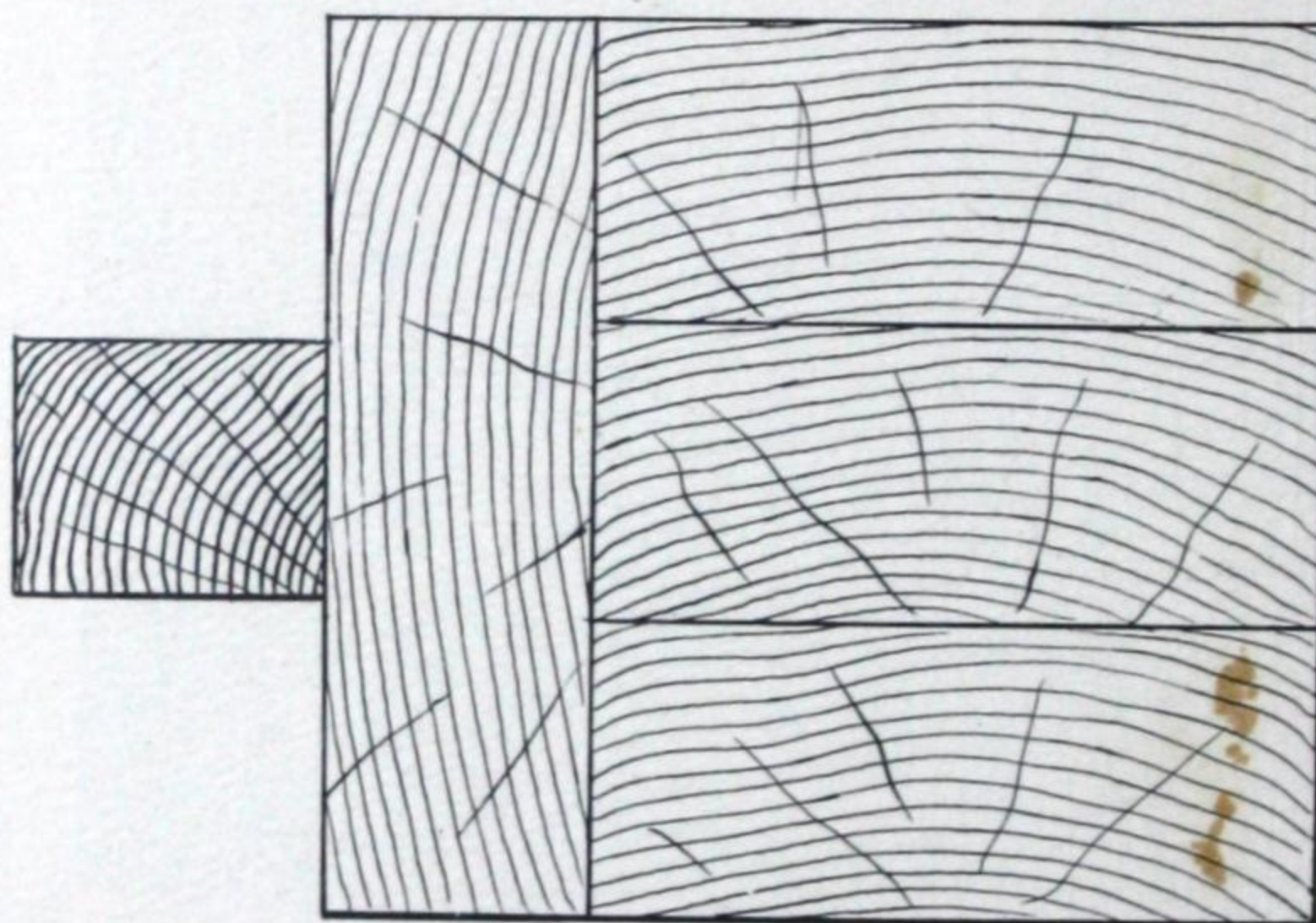


Figure 3. Compound Guide Post

The guide strips are made of well-seasoned kiln-dried maple, being tongued, grooved and drilled on a special machine built for this purpose. No difficulty can be experienced in accurately erecting.

GEAR AND DRUMS

PARTICULAR attention is directed to the gear and drums shown in Figure 4.

These drums are made of iron with machine scored grooves. This construction is a marked improvement over the wood or cast groove drums.

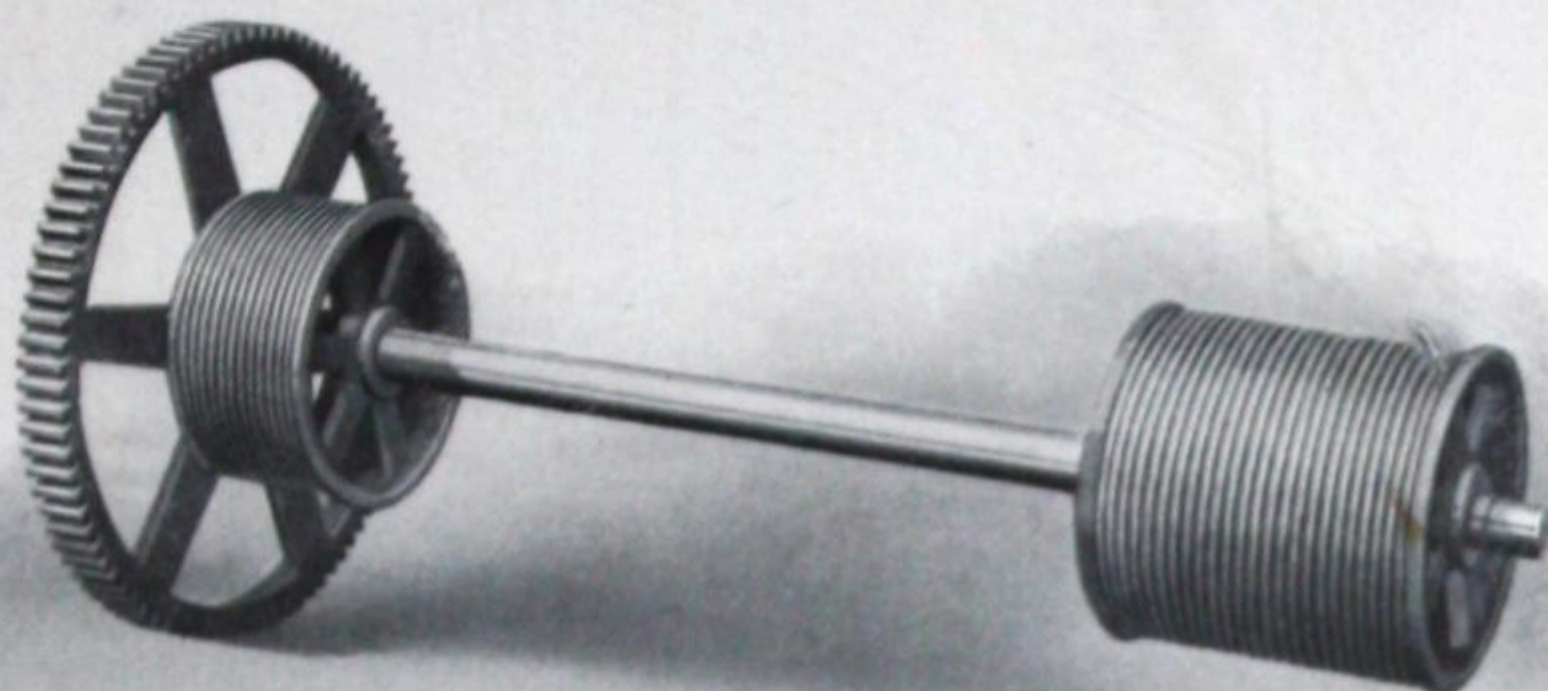


Figure 4. Gear and Drum

Another indication of Otis quality is shown in Figure 5.

This is the steel anti-friction roller bearing in which all shafts are mounted, thus making a smooth and easy running elevator instead of the usual "*Man Killer*."



Figure 5. Roller Bearing

ROPE WHEEL

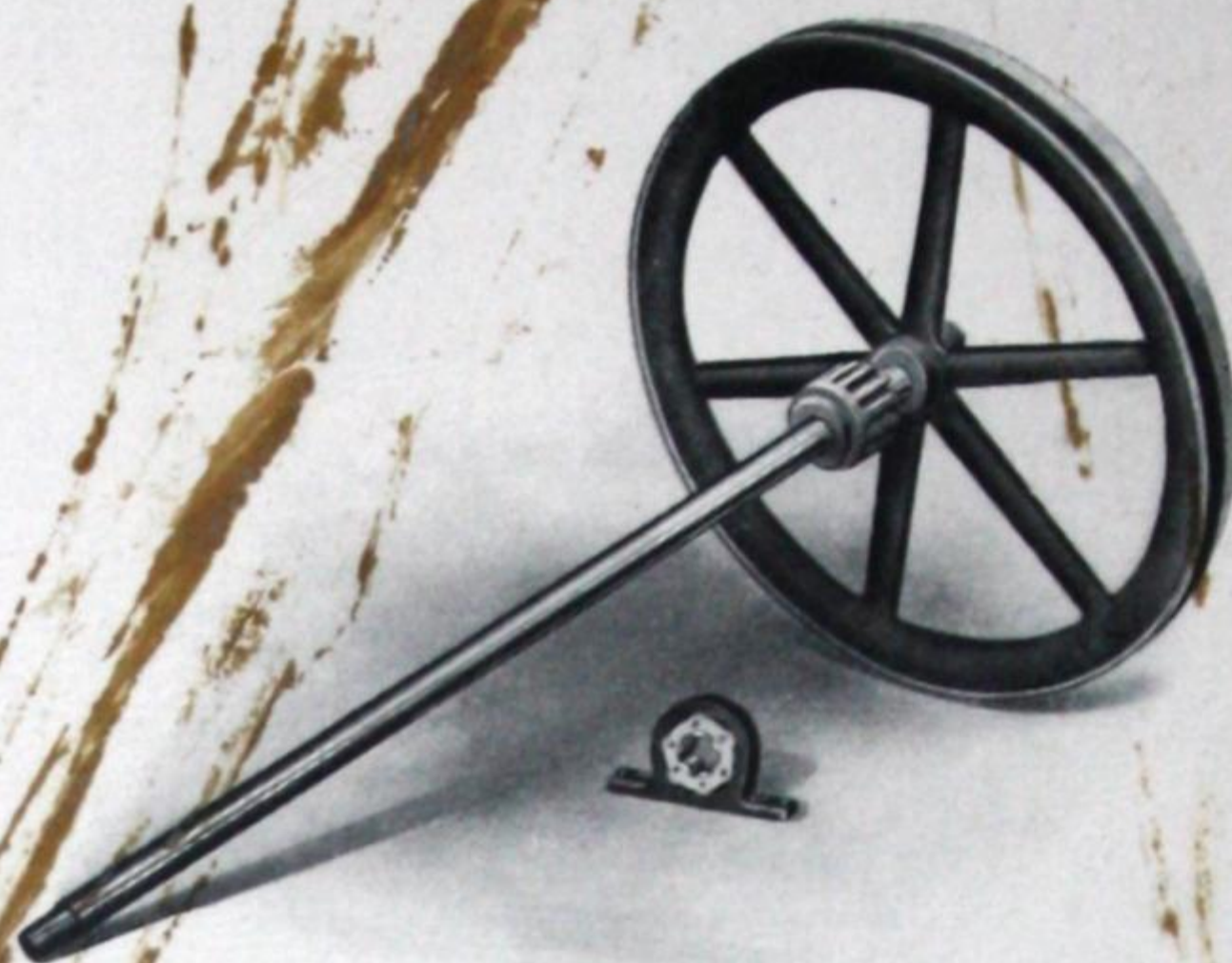


Figure 6. Rope Wheel

THE parts shown in Figure 6 are the Rope or "Pull" Wheel and Pinion. These are accurately made and mounted on a heavy steel shaft. The flange of the Rope Wheel, on which the brake operates, is accurately machined insuring a positive and easy stop.

BRAKE



Figure 7. 4-A Brake

Realizing the importance of the brake, every care has been taken to provide *Otis Elevators* with the best possible braking appliance. The illustration (Figure 7) shows the cam or rocker style—(used with the 4-A elevator) a type which has proven most safe and efficient. The brake is made substantially throughout and the shoe is lined with leather to insure both gripping efficiency and quietness of operation.

H A N D P O W E R E L E V A T O R S

INSTRUCTIONS

WE give below a fac-simile of our Standard Erecting Instructions, which we send out with every 4-A elevator. With these instructions also go erection drawings, showing the purchaser the best and most economical way in which to erect.

OTIS ELEVATOR COMPANY

DIRECTIONS FOR ERECTING HAND POWER ELEVATOR SIZE No 4-A

Before commencing work, be sure that the openings in the different floors are PLUMB, and that dimensions agree with those indicated on erection plan.

GUIDE POSTS

After locating center line of opening (front to back) place the main guide posts on counterweight side in position. As the erecting plan shows, the side of this post next to the counterweight should be 4 inches from the center line of opening, and should project into opening 4- $\frac{1}{4}$ inches.

The guide posts (usually furnished by purchaser) are 5- $\frac{1}{2}$ " x 5- $\frac{1}{4}$ " (except in upper story, which are 5- $\frac{1}{2}$ " x 7" and are shipped with elevator). The face of these upper posts should be flush with those placed in lower stories.

Next, place weight post in position, taking proper measurement from erection plan after which the main guide post on opposite side of hatchway should be placed. Care should be taken to have the measurement between these posts exactly in accordance with the erection plan. A gauge giving this exact measurement is sent with each elevator and will be found attached to one of the posts.

GEARING

The gearing should now be placed and care taken to have shafts revolve freely in the roller bearings. Attach all guide strips with exception of about eight feet in the lower story, put platform together and place in proper position.

ROPES

The cables should now be secured by means of the clamps inside of drums and to the eye bolts on platform. The lifting cables should be even in length and the same allowance made for take-up at eye bolts.

Place hand rope in place; the post in lower story should be slotted as shown in erecting plan, and before splicing this rope have it when hanging free reach about midway of the slot so that in case of shrinkage the rope will not bind against the post. Place brake rope in position, passing around the two small sheaves at lower landing. Raise platform to upper landing and attach guide strips at bottom.

COUNTERWEIGHTS

Place counterweights in guides, with a 12 inch block underneath; attach counterweight cable, lower platform, and remove block under weight.

Bring platform level by adjusting eye bolts to which lifting cables are attached.

SAFETY DEVICE

The trip rods at each side of platform should be evenly adjusted by means of adjusting nuts at top of each rod. The lower end of each rod is fitted with a special washer (No 1983), holding a coil spring (No 723) the rod passing through bracket (No 1975). The adjustment of each rod should be such that the washer just touches the safety dog (No 1969). Be positive that safety dogs clear the guide strips.

GENERAL ADJUSTMENTS

Be careful to tighten all bolts and nuts, and, before using, go carefully over the joints of guide strips, leaving them perfectly smooth. For lubricating guide strips use a good quality of hard grease (not containing rosin.) Examine brake to see that shoe clears rim of wheel when released. All parts should operate freely, without binding or unnecessary friction.

NO. 2 CENTER LIFT
HAND POWER ELEVATOR

THE No. 2 is a type of elevator expressly designed for heavy loads and hard service. To meet these requirements we furnish a strongly braced steel frame car (with ample counterbalance) and gearing of the highest efficiency. The rope or pull wheel may be placed at either the front or at the side, thus making it possible to install this type in either an open or enclosed hatchway.

We strongly recommend the sidepost arrangement shown in illustration. When conditions are such that the guide posts must be placed in the corners of hatchway, we can furnish special construction, for which drawings are necessary in each case to show size of hatchway required.

The illustration on the opposite page shows the construction to be a radical improvement over the old-fashioned "Wooden Type."

Specifications for the above are as follows:

Winding Machine

Rope or Pull Wheel
Shafts and Gearing
Iron Drums
Roller Bearings
Steel Band Brake

Overhead Frames

Counterweights
Adjustable

Platform—Steel Frame

Safety Device

Guide Strips

Maple

Ropes

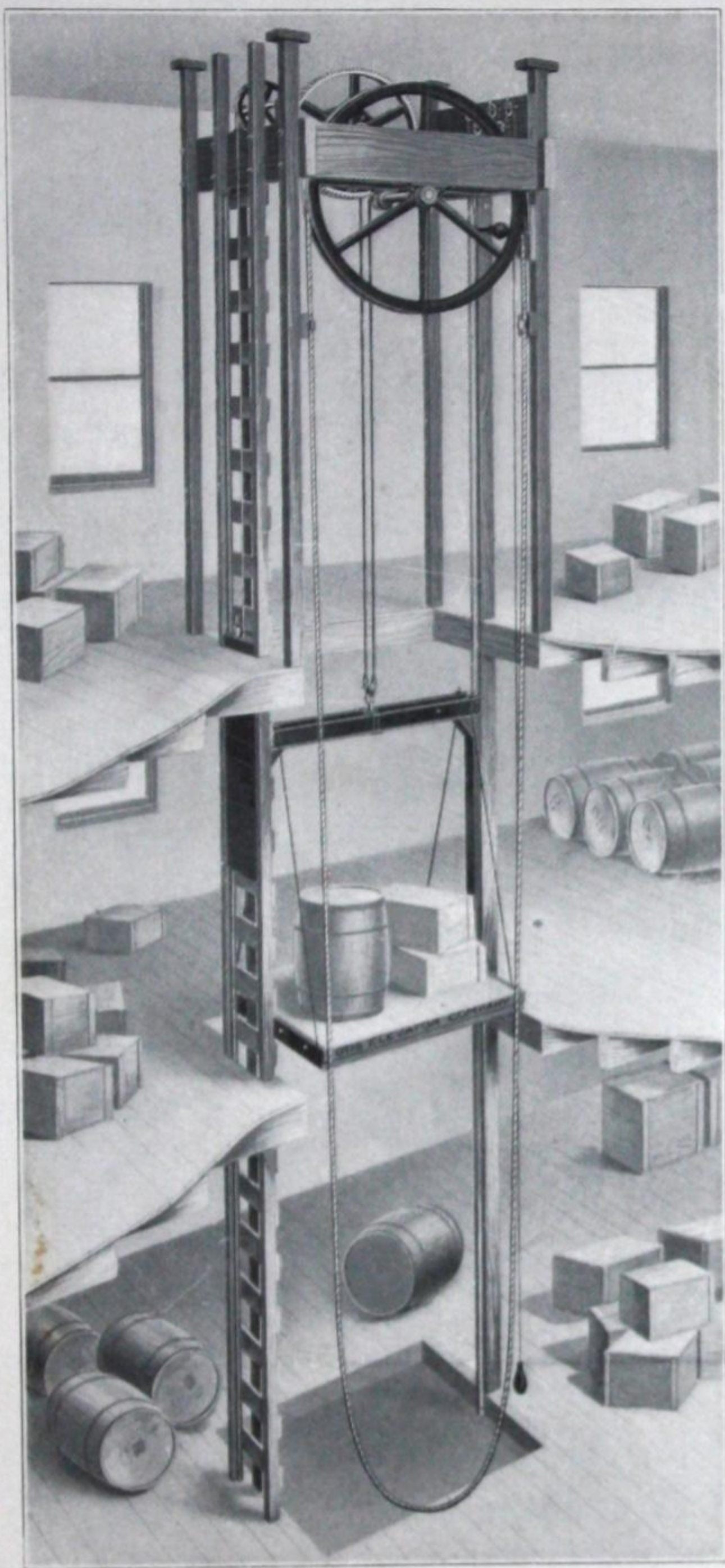
Two $\frac{1}{2}$ " Iron Lifting Cables
One $\frac{1}{2}$ " Iron Weight Cable
One $1\frac{1}{8}$ " Manila Hand Rope
One $\frac{1}{2}$ " Brake Rope

We furnish complete drawings and instructions for erecting.

H A N D P O W E R E L E V A T O R S

NO. 2 CENTER LIFT HAND POWER ELEVATOR

Capacities 1500, 2000, 2500 and 3000 lbs.



STANDARD SIZES

Postwise		Front to Back	Postwise		Front to Back
4' 0"	x	5' 0"	5' 0"	x	7' 0"
4' 0"	x	6' 0"	6' 0"	x	6' 0"
5' 0"	x	5' 0"	6' 0"	x	7' 0"
5' 0"	x	6' 0"	7' 0"	x	7' 0"

NO. 1 CARRIAGE TYPE ELEVATOR

THE No. 1, commonly called the "Carriage Elevator," is designed for use where the articles to be handled are large in size but light in weight. This type is used extensively in implement houses, livery stables, barns, etc.

Particular attention is called to the channel side rails on the platform; this makes a most rigid construction. Another important feature (to be found on all Otis Elevators of this type) is the beveled or sloping edges of the platform. This permits of an installation without the usually required pit, thus saving not only expense of erection, but also the necessity of cutting or otherwise disfiguring the lower floor.

Specifications for the above are as follows:

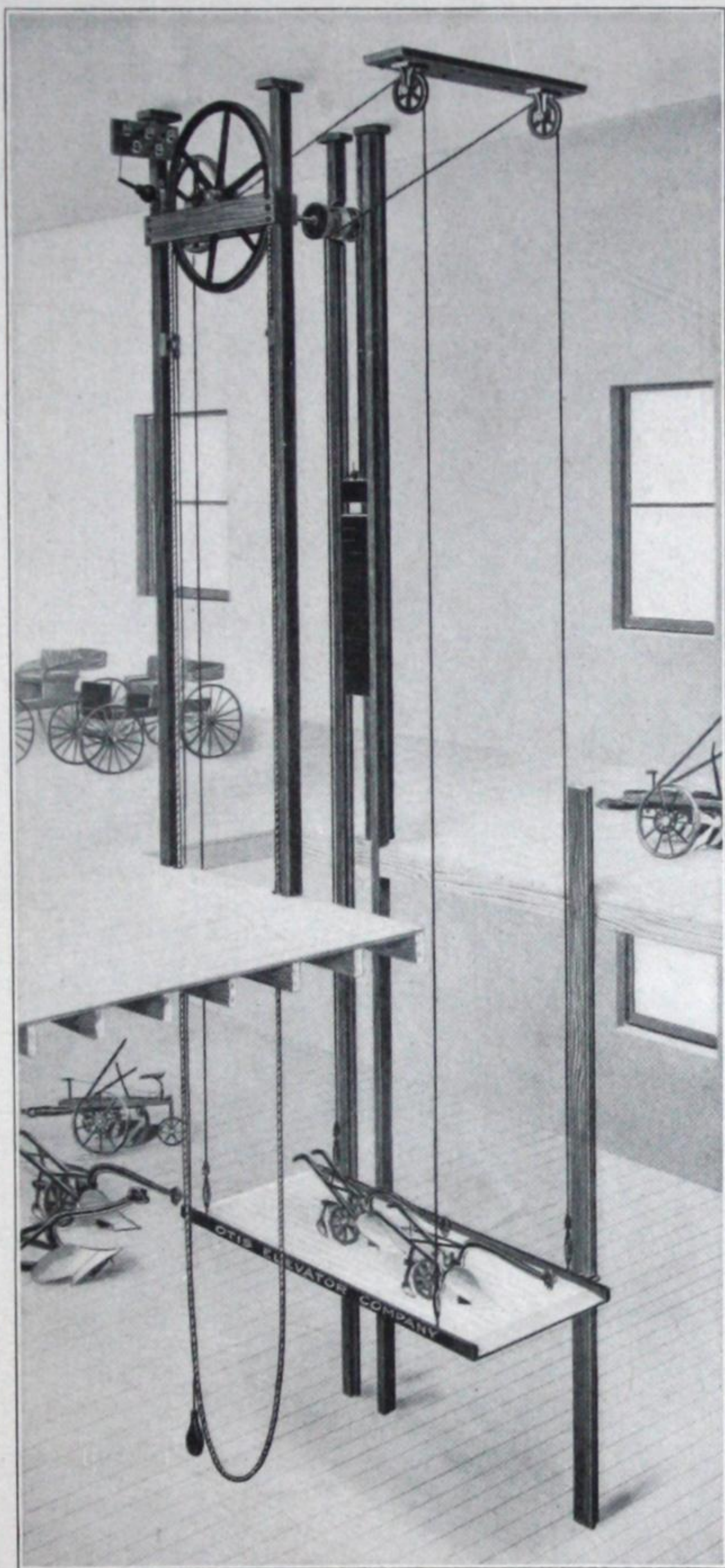
Winding Machine	Platform
Rope or Pull Wheel	Flat Bottom
Shafts and Gearing	Channel Side Rails
Iron Drums	Guide Strips
Roller Bearings	Maple
Steel Band Brake	Ropes
Ceiling Sheaves and Hangers	Four $\frac{1}{2}$ " Iron Lifting Cables
Horizontal Supports for Winding Machine	One $\frac{1}{2}$ " Iron Weight Cable
Counterweights	One $1\frac{1}{8}$ " Manila Hand Rope
Adjustable	One $\frac{1}{2}$ " Brake Rope

We furnish complete drawings and instructions for erecting.

H A N D P O W E R E L E V A T O R S

NO. 1 CARRIAGE TYPE ELEVATOR

Capacities 1500 and 2000 lbs.



STANDARD SIZES

Postwise	Front to Back	Postwise	Front to Back	Postwise	Front to back
6' 0"	x 12' 0"	6' 0"	x 14' 0"	7' 0"	x 14' 0"

NO. 2 CARRIAGE TYPE ELEVATOR

THE No. 2, or intermediate size of the "Carriage Type," meets the requirements of an ever-growing demand for a powerful, easy running automobile or wagon lift at a reasonable price. Its wide range of capacities, 2500, 3000 and 4000 pounds, *exclusive* of weight of car, makes this an ideal machine for general use.

Specifications for the above are as follows:

Winding Machine

Rope or Pull Wheel
Shafts and Gearing
Iron Drums
Roller Bearings
Steel Band Brake

Platform

Flat Bottom
Channel Side Rails

Guide Strips

Maple

Ceiling Sheaves and

Hangers

Horizontal Supports for
Winding Machine

Counterweights

Adjustable

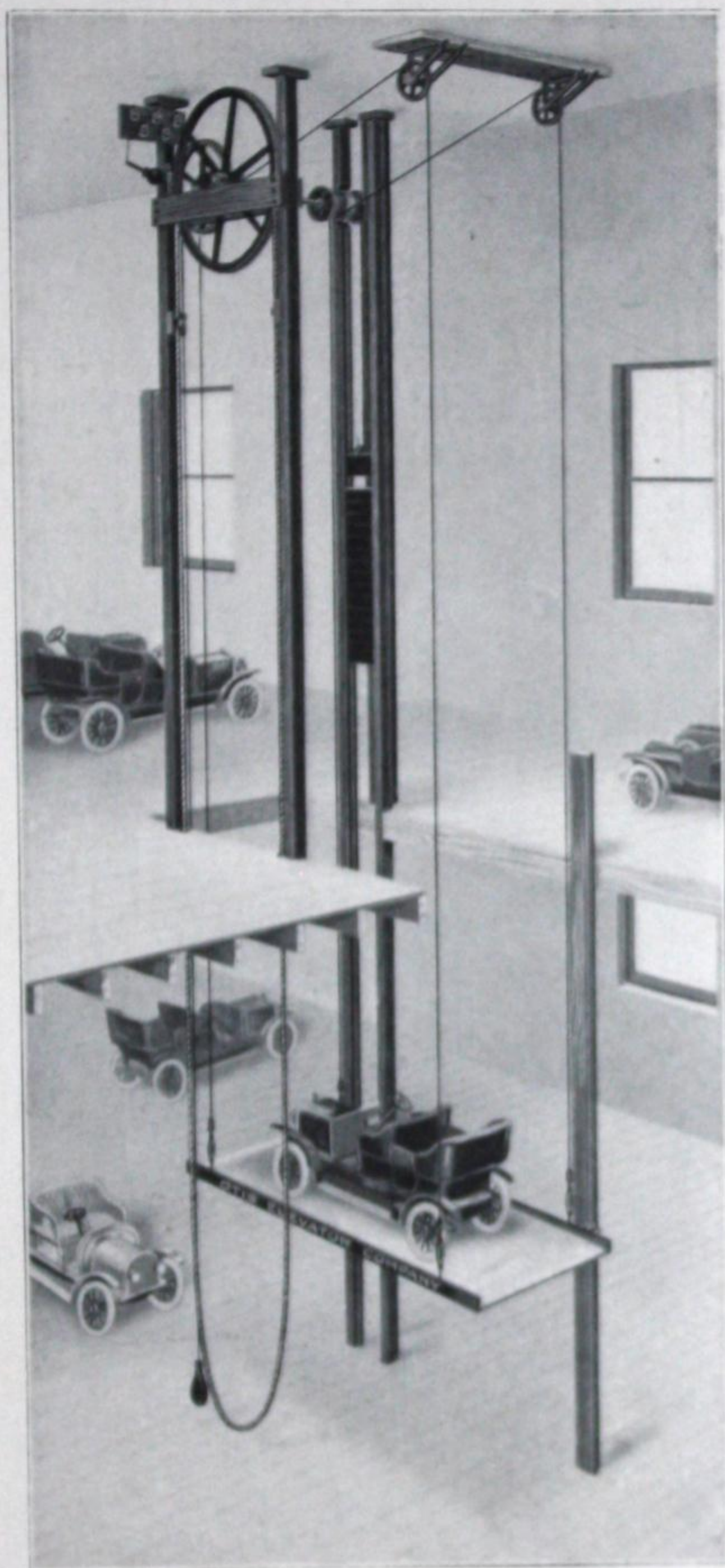
Ropes

Four $\frac{9}{16}$ " Iron Lifting Cables
One $\frac{9}{16}$ " Iron Weight Cable
One $1\frac{1}{8}$ " Manila Hand Rope
One $\frac{1}{2}$ " Brake Rope

We furnish complete drawings and instructions for erecting.

H A N D P O W E R E L E V A T O R S

NO. 2 CARRIAGE TYPE ELEVATOR Capacities 2500, 3000 and 4000 lbs.



STANDARD SIZES

Postwise		Front to Back	Postwise		Front to Back
6' 0"	X	12' 0"	7' 0"	X	16' 0"
6' 0"	X	14' 0"	8' 0"	X	16' 0"
7' 0"	X	14' 0"	8' 0"	X	18' 0"

NO. 3 CARRIAGE TYPE ELEVATOR

THE lifting capacity and ease of operation of this elevator are increased materially beyond the range of the ordinary elevator of this general type by the adoption of a *Double Reduction Gear*, the use of which, combined with high-class workmanship, enables us to offer a machine to meet the maximum necessities of garage service.

If you wish to convert the second story of your garage into a "Money Maker" write us for prices and further particulars.

Specifications for the above are as follows:

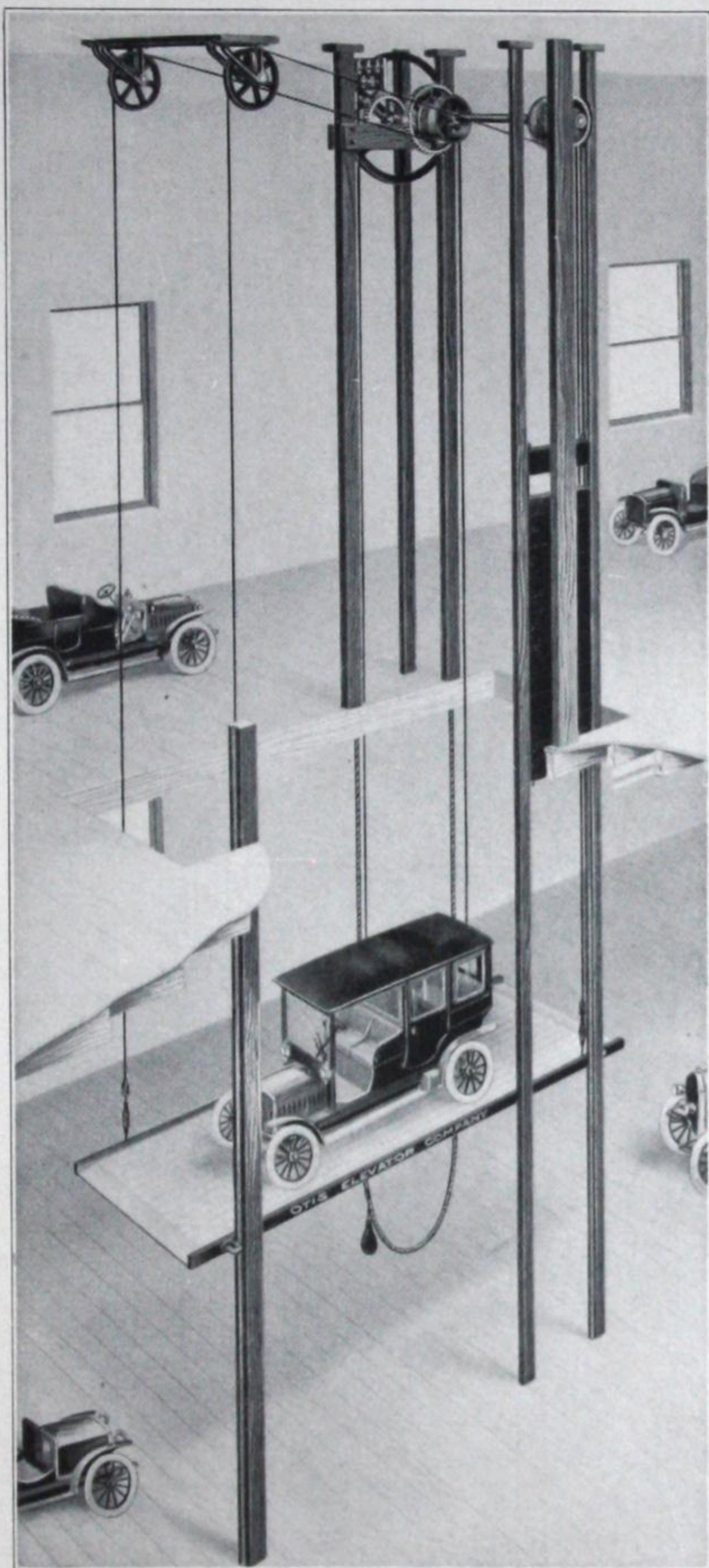
Winding Machine	Platform
Rope or Pull Wheel	Flat Bottom
Double Gearing	Channel Side Rails
Iron Drums	Guide Strips
Roller Bearings	Maple
Steel Band Brake	
Ceiling Sheaves and Hangers	Ropes
Horizontal Supports for Winding Machine	Four $\frac{5}{8}$ " Iron Lifting Cables
	One $\frac{5}{8}$ " Iron Weight Cable
	One $1\frac{1}{8}$ " Manila Hand Rope
	One $\frac{1}{2}$ " Brake Rope
Counterweights	
Adjustable	

We furnish complete drawings and instructions for erecting.

H A N D P O W E R E L E V A T O R S

NO. 3 CARRIAGE TYPE ELEVATOR

Capacities 5000 and 6000 lbs.



STANDARD SIZES

Postwise		Front to Back	Postwise		Front to Back
8' 0"	x	16' 0"	8' 0"	x	20' 0"
8' 0"	x	18' 0"	9' 0"	x	18' 0"

NO. 1 BASEMENT ELEVATOR

THE No. 1 "Basement" or "Sidewalk" Elevator is the acme of simplicity and perfection, and requires the smallest amount of space of any machine of this type yet produced.

By attaching the iron lifting cables to each side of the platform a very simple construction is obtained, while the equipment is made entirely self contained or self supporting except for the top and bottom anchorages, by carrying the drums and gearing on the guide angles.

The features outlined above result in a very considerable saving in erection labor.

This type cannot be installed in an enclosed shaft, nor with the gears close to a wall or partition,—see page 28.

Specifications for the above are as follows:

Winding Machine
Hand Wheel
Shoe Brake
Spur Gearing
Iron Drums
Steel Shaft
Bearings

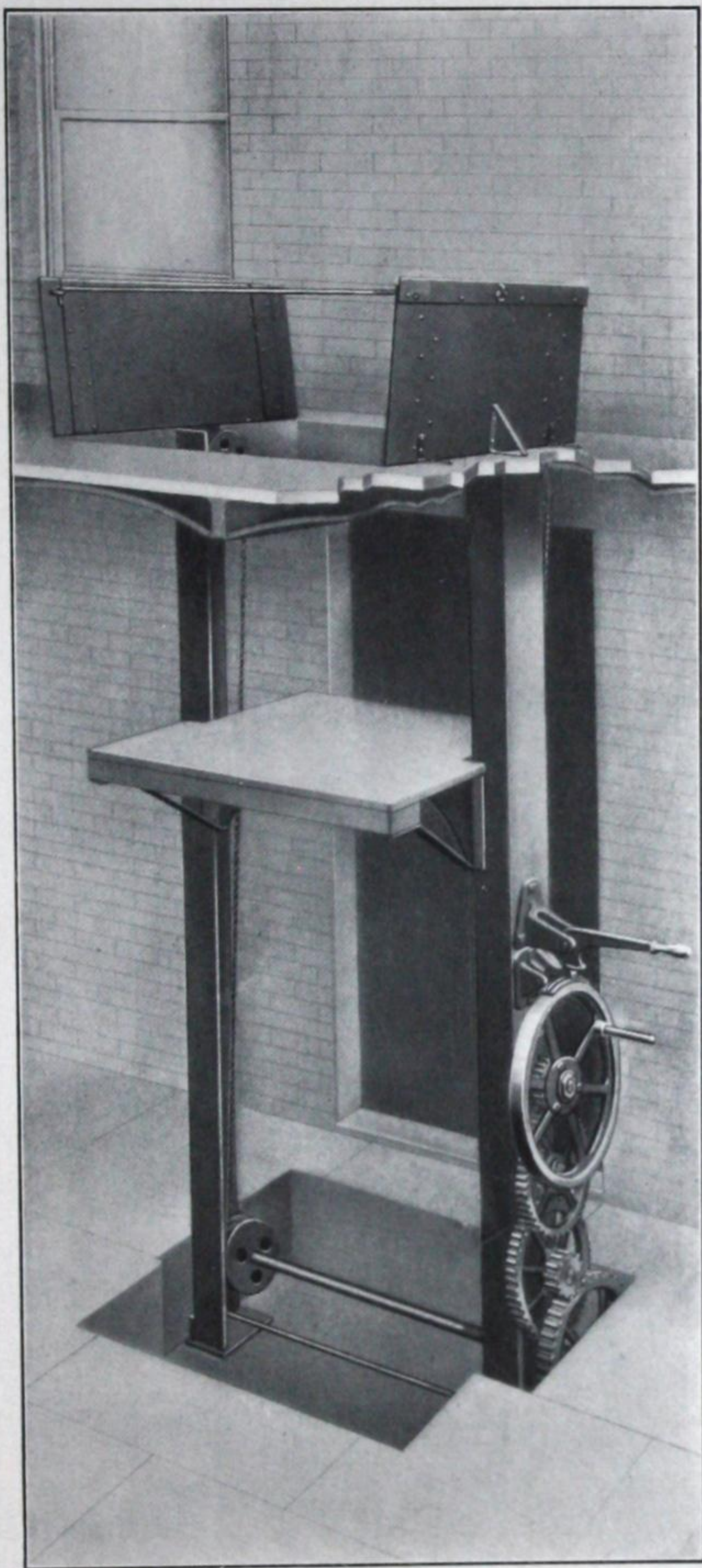
Platform
Guide Posts
of Heavy Steel Angles
Overhead Sheaves
Ropes
Two $\frac{1}{2}$ " Iron Lifting Cables

We furnish complete drawings and instructions for erecting.

H A N D P O W E R E L E V A T O R S

NO. 1 BASEMENT ELEVATOR

Capacities 500 to 2500 lbs.



STANDARD SIZES

Postwise		Front to Back	Postwise		Front to Back
3' 0"	x	4' 0"	6' 0"	x	4' 0"
4' 0"	x	4' 0"	7' 0"	x	5' 0"
5' 0"	x	4' 0"			

NO. 2 BASEMENT ELEVATOR

THE No. 2 "Basement" Elevator is of the same general design as the No. 1, but differs therefrom in the position of the hand wheel, which is set away from the main gearing. This arrangement is necessary where the gearing is too close to the wall to permit of operating the hand wheel as it is arranged on the No. 1.

Specifications for the above are as follows:

Winding Machine

Hand Wheel
Shoe Brake
Spur Gearing
Chain and Sprocket
Iron Drums
Steel Shaft
Bearings

Platform

Guide Posts
of Heavy Steel Angles
Overhead Sheaves
Ropes
Two $\frac{1}{2}$ " Iron Lifting Cables

We furnish complete drawings and instructions for erecting.

TRUNK LIFT AND INVALID HOIST

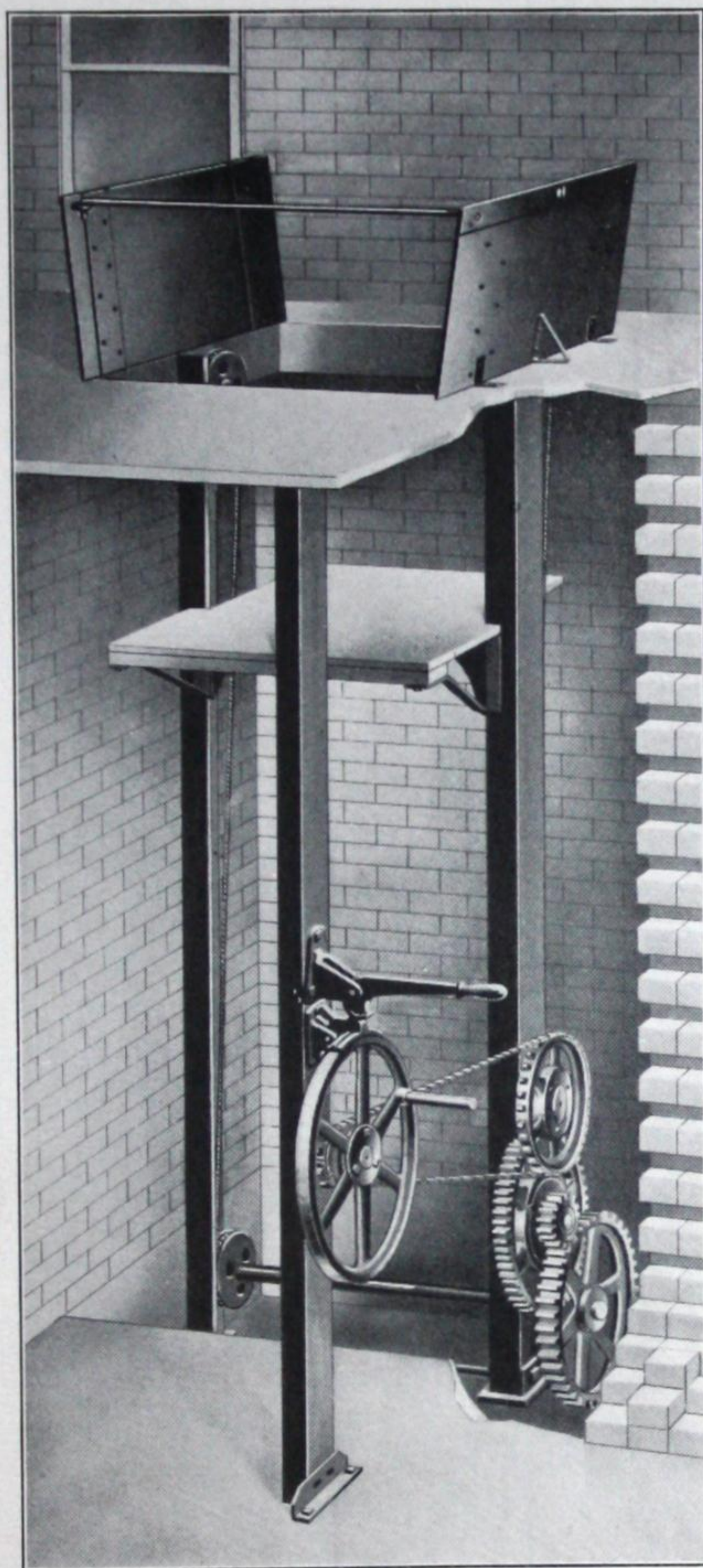
WHILE our No. 1 "Center Lift," shown on page 9, can be used for residence service, it is designed strictly as a freight elevator, and as such, is not equipped with all of the refinements which are usually required in residence lifts. We have therefore designed a special Hand Elevator for House Service, one that is smooth running, quiet, easily operated, and very moderate in price.

We will submit specifications and prices on request.

H A N D P O W E R E L E V A T O R S

NO. 2 BASEMENT ELEVATOR

Capacities 500 to 2500 lbs.



STANDARD SIZES

Postwise		Front to Back	Postwise		Front to Back
3' 0"	x	4' 0"	6' 0"	x	4' 0"
4' 0"	x	4' 0"	7' 0"	x	5' 0"
5' 0"	x	4' 0"			

DIRECTORY OF OFFICES

UNITED STATES

- Akron, Ohio—573 Wright Avenue.
 Albany, N. Y.—40 Beaver Street.
 Altoona, Pa.—804 Chestnut Ave.
Atlanta, Ga.—Kontz Building.
 Atlantic City, N. J.—14 North Presbyterian Ave.
 Augusta, Ga.—9th and Reynolds Sts.
 Baltimore, Md.—Equitable Bldg.
 Birmingham, Ala.—426 S. 20th St.
Boston, Mass.—34-35 India St.
 Buffalo, N. Y.—Franklin and Huron Sts.
 Works: Northland Avenue and Grider Street.
 Charleston, S. C.—155 Meeting St.
 Charleston, W. Va.—19 Hale St.
 Charlotte, N. C.—209 N. College St.
 Chattanooga, Tenn.—819 Cherry St.
Chicago, Ill.—600 West Jackson Boulevard.
 Cincinnati, Ohio—1014 Mercantile Library, Building.
Cleveland, Ohio—526-31 Leader-News Building.
 Columbia, S. C.—1124 Hampton Ave.
 Columbus, Ohio—230 N. Third St.
 Dallas, Tex.—Young and Akard Sts.
 Davenport, Iowa—218 E. Third St.
 Dayton, Ohio—509 E. Third Street.
 Denver, Colo.—1626-28 Glenarm St.
 Des Moines, Iowa—409 W. Fifth St.
 Detroit, Mich.—Fifth and Fort Sts.
 Duluth, Minn.—329 W. Michigan St.
 El Paso, Tex.—103 S. Chihuahua St.
 Erie, Pa.—1509 Sassafras Street.
 Fort Wayne, Ind.—1220 Lake Ave.
 Fort Worth, Texas—215 Dan Wagoner Bldg.
 Fresno, Cal.—932 "H" Street.
 Grand Rapids, Mich.—7 Oakes St. S.W.
 Harrisburg, Pa.—28 S. Third St.
 Harrison, N. J.—Works: First Street and Railroad Avenue.
 Hartford, Conn.—Courant Bldg.
Houston Tex.—3118 German Street.
 Indianapolis, Ind.—101-7 Kentucky Ave.
 Jacksonville, Fla.—210 E. Forsythe St.
 Kalamazoo, Mich.—236 East South St.
 Kansas City, Mo.—1918-20 Wyandotte Street.
 Knoxville, Tenn.—424 Wall Street.
 Little Rock, Ark.—220 Center St.
 Los Angeles, Cal.—218-20 E. Fourth St.
 Louisville, Ky.—206 West Main St.
 Lynchburg, Va.—109 Eighth St.
 Macon, Ga.—Georgia Casualty Co. Building.
 Memphis, Tenn.—292 Monroe Ave.
 Milwaukee, Wis.—115-117 Huron St.
 Minneapolis, Minn.—415 S. Fourth St.
 Mobile, Ala.—256 St. Michael St.
 Montgomery, Ala.—106 North Perry St.
 Muskogee, Okla.—228 West Broadway.
 Nashville, Tenn.—148 Sixth St.—N.
 New Haven, Conn.—124 Meadow St.
 New Orleans, La.—852 Carondelet St.
New York, N. Y.—Eleventh Ave. and Twenty-sixth St.
 Norfolk, Va.—42 Fayette Street.
 Oakland, Cal.—318 Dalzell Bldg.
 Oklahoma City, Okla.—213 W. First St.
Omaha, Neb.—1214 Howard St.
 Peoria, Ill.—233 Bridge Street.
Philadelphia, Pa.—12th and Sansom Streets.
 Pittsburgh, Pa.—1201-7 Keenan Bldg.
 Portland, Me.—495 Fore Street.
 Portland, Ore.—88 First Street.
 Providence, R. I.—218-222 S. Main St.
 Quincy, Ill.—Works.
 Reading, Pa.—420 Chestnut Street.
 Richmond, Va.—12 South Tenth St.
 Rochester, N. Y.—8-10 Jones Street.
 Rockford, Ill.—703 Woodlawn Ave.
 Sacramento, Cal.—Forum Bldg.
 Salt Lake City, Utah—606-9 Judge Bldg.
 San Antonio, Tex.—610 Market St.
 San Diego, Cal.—227 Timken Bldg.
San Francisco, Cal.—2300 Stockton Street.
 Savannah, Ga.—Germania National Bank Building.
 Scranton, Pa.—217 Spruce Street.
 Seattle, Wash.—1202-4 Fourth Ave.
 Shreveport La.—501 Continental Bank Building.
 Spokane, Wash.—228 S. Washington Street.
 Springfield, Mass.—224 Worthington St.
 Springfield, Mo.—219 N. Campbell St.
 St. Joseph, Mo.—Corby Building.
St. Louis Mo.—Locust and 23rd Streets.
 St. Paul, Minn.—Endicott Bldg.
 Syracuse, N. Y.—374 West Fayette St.
 Tacoma, Wash.—Perkins Building.
 Tampa, Fla.—S. W. Cor. Zack and Tampa Streets.
 Toledo, Ohio—307 Tenth Street.
 Trenton, N. J.—821 Cartaret Ave.
 Tulsa, Okla.—318 First National Bank Building.
 Utica, N. Y.—10 Catharine Street.
 Waco, Tex.—1512 Amicable Bldg.
 Washington, D. C.—303-8 Metropolitan Bank Building.
 Wheeling, W. Va.—Schmulbach Bldg.
 Wilmington, Del.—10th and Market Streets.
 Wichita, Kan.—147 South Greene St.
 Worcester, Mass.—311 Main Street.
 Yonkers, N. Y.—Works: Wells and Woodworth Avenues.
 Youngstown, O.—120 E. Boardman St.

CANADA.

Otis-Fensom Elevator Co., Ltd.—
Main Office: 50 Bay Street,
Toronto, Ont.

Works: Victoria Avenue North,
Hamilton, Ont.

BRANCHES

Calgary, Alberta—Tees & Persse Bldg.,
322 Ninth Ave. W.

Edmonton, Alberta—McKenney Bldg.,
562 Second St.

Montreal, P. Q.—368 St. James St.

Ottawa, Ontario—254 Queen St.

Quebec, P. Q.—Dominion Bldg., 126
St. Peter Street.

Regina, Saskatchewan—106 Donohue
Block.

Vancouver, B. C.—1152 Mainland Ave.

Victoria, B. C.—526 Chancery Lane.

Winnipeg, Manitoba—316 Cumberland
Ave.

Halifax, Nova Scotia—146 Hollis St.

FOREIGN.**ENGLAND.****Waygood-Otis Limited.**

London, Falmouth Road—Great
Dover Street.

Birmingham—63 Lionel Street.

Cardiff—6-7 St. Johns Square.

Glasgow—116 Hope Street.

Leeds—Standard Bldgs.

Liverpool—Royal Liver Bldgs.

Manchester—90 Princess Street.

Newcastle—Pilgrim House, Pilgrim St.

GERMANY.

Otis-Aufzugswerke Gesellschaft,
mit beschränkter Haftung.

Berlin, 97 Königgratzerstrasse.

Factory: Wittenau, Berlin Innungstr.

Cologne—Deichmannshaus.

Hamburg—27 Schwanenwik.

AUSTRIA.

Otis Aufzugswerke Gesellschaft,
mit beschränkter Haftung.

Vienna, IX, 6 Wahingerstrasse.

HUNGARY.

Otis Aufzugswerke Gesellschaft,
mit beschränkter Haftung.

Budapest, V, 3 Vecseyutca.

SWITZERLAND.

Waedenswil, Otis Aufzugswerke,
Waedenswil.

Zurich—Factory:—Waedenswil.

RUSSIA.

Otis Aufzugswerke Gesellschaft,
mit beschränkter Haftung.

Petrograd—21, Newsky Prospekt.

Moscow—Otis Aufzugswerke Gesell-
schaft, mit beschränkter Haftung,
Miasnitskaia 24.

Warsaw—Chr. Brun & Son, Hotel
Bristol.

HOLLAND.

Amsterdam—Fred. Stieltjes & Co.,
745 Keizersgracht.

SPAIN.

Madrid—Ateliers Otis-Pifre, 32
Ronda de Atocha.

FRANCE.

Paris, Ateliers Otis-Pifre, 174
Rue de Courcelles.

Nice, Ateliers Otis-Pifre, 9 Rue Gounod
Lyon, Ateliers Otis-Pifre, 28 bis rue
Dumoulin.

Marseille, Ateliers Otis-Pifre, 22 Pl.
Thiars.

Bordeaux, Monsieur Le Cordener,
9 cours de Gourgues.

BELGIUM.

Compagnie Belge des Ascenseurs
Otis.

Brussels—Chaussee d'Anvers 102.

Antwerp—16 Rue Gerard.

Ostend—Rue Francois Musin 41.

SOUTH AFRICA.**Waygood-Lifts Limited.**

Johannesburg—1/2 Mutual Bldgs.

CUBA.

Havana—Zaldo & Martinez, 36-38
O'Reilly Street.

MEXICO.

Mexico City—Otis Elevator Com-
pany, Calle Lopez No. 8.

INDIA.

Calcutta—Balmer Lawrie & Co.,
103 Clive Street.

JAPAN.

Kobe—American Trading Company
No. 99.

Yokohama—American Trading Com-
pany, 28 Main Street.

SOUTH AMERICA.

Rio de Janeiro, Brazil—Otis Elevator
Company, Rua do Saude No. 3.

Sao Paulo, Brazil—Otis Elevator Com-
pany, Rua Libero Badaro No. 11.

Buenos Aires, Argentine—Buxton
Olditch & Co., Calle Suipacha,
Esq., Tucuman.

Rosario de Santa Fe, Argentine—
Buxton Olditch & Co., San Lor-
enzo, 1201 Esq. Mitre.

Santiago, Chile, Spencer & Waters,
Casilla 627, or Pasaje Balmaceda
No. 11.

Valparaiso, Chile—Spencer & Waters.

AUSTRALIA.

Standard Waygood Hercules, Ltd.
Sydney—77 King Street.

Adelaide, Australia. (Branch Office)

Auckland, N. Z. " "

Brisbane, Australia. " "

Christchurch, N. Z. " "

Dunedin, N. Z. " "

Hobart, Tasmania, Aust. " "

Melbourne, Australia. " "

Perth, Australia. " "

Wellington, N. Z. " "

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CCA



OTIS GRAVITY SPIRAL CONVEYORS



OTIS
ELEVATOR
COMPANY

OFFICES IN ALL PRINCIPAL CITIES
OF THE WORLD

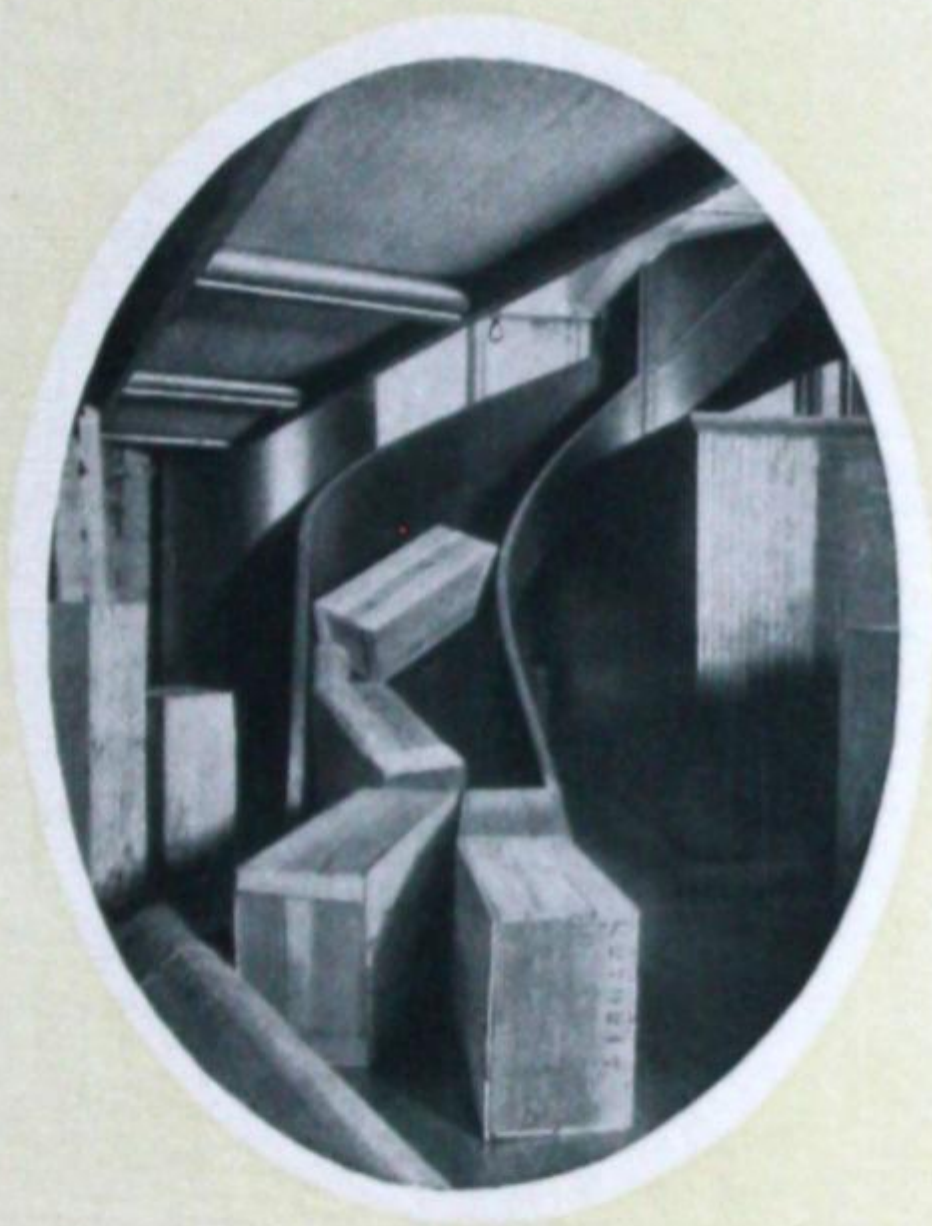


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OTIS ELEVATOR COMPAN

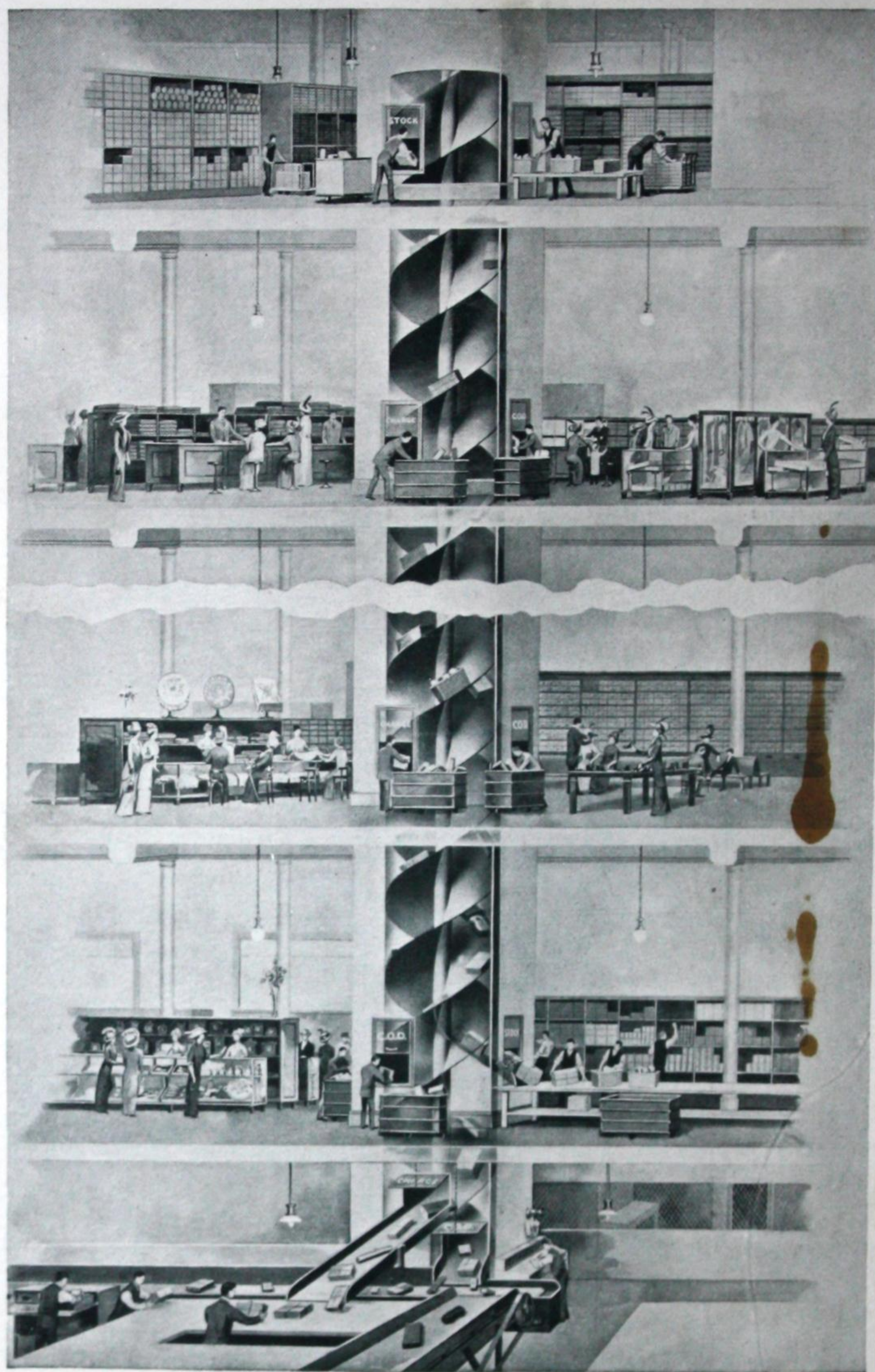
OTIS GRAVITY SPIRAL CONVEYORS

For lowering packaged merchandise and boxed, cased, bagged and barrelled goods



OTIS ELEVATOR COMPANY

Offices in all Principal Cities
of the World



Cross Section View showing Construction and Arrangement of
Triple Spiral Closed Type Conveyor.

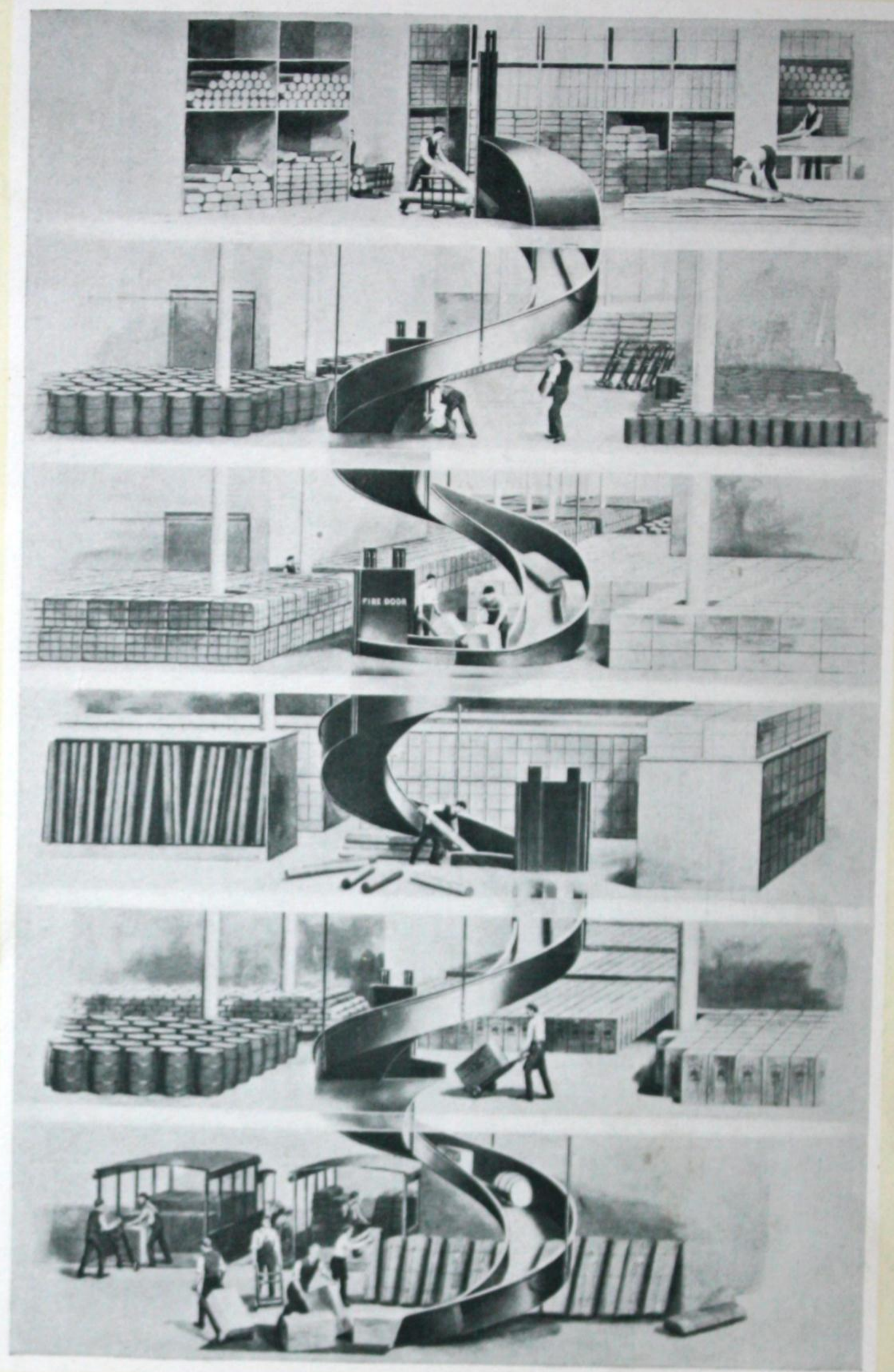
OTIS GRAVITY SPIRAL CONVEYORS

OTIS Gravity Spiral Conveyors utilize the force due to gravity to convey merchandise upon fixed spiral blades within a circular shaft from upper floors to lower floors or to shipping and assorting rooms below. They are adapted also for use in factories where the manufacturing process is from the top floor downward, to move unfinished parts from floor to floor. They afford a continuous delivery service, require no power, are always ready for use and have a practically unlimited capacity. Every business establishment occupying two or more floors and having packages, boxes or barrels to ship can reduce its handling expense and at the same time speed up its deliveries by using Otis Gravity Spiral Conveyors.

These Conveyors may have inlets at all floors or at any desired floors, through which the merchandise to be moved is placed upon the spiral blades. The pitch of the blades is in every case calculated with such precision that the packages are carried downward rapidly but in absolute safety to the outlets. The number of floors which may be served by a Conveyor is practically unlimited.

A great variety of types, each useful in its sphere of application, makes it possible for every factory, warehouse, store and public building where small packages or large boxes and barrels are handled, to install this economical and speedy system of inter-floor merchandise handling. The diameter of the Conveyors while varying with the different types and the work they are to do, usually range from three to twelve feet.

The remarkable success of the early single spiral installations in furnishing a safe, speedy and economical method of merchandise handling led quickly to the development and adoption of Conveyors with two and three spirals. The latter, as well as giving increased



Cross Section View showing Construction of Single Spiral Open Type Conveyor.
Without Supporting Core.

capacity, permit the segregation of different classes of merchandise if desired.

Since the first installation in 1903, we have furnished nearly four hundred of these Gravity Spiral Conveyors for many lines of industry. These installations, many of them repeat orders, testify to the efficiency and reliability of Otis Gravity Spiral Conveyors. Superior design, high-class workmanship and the relentless inspection to which every Conveyor is subjected give assurance of satisfactory and lasting service.

TYPES.

To handle innumerable different sizes, shapes and weights of packages, it has been found desirable to adopt two general types—open and closed—the open type having one or two spiral blades unenclosed; the closed type having one, two or three spirals contained in a cylindrical metal shaft.

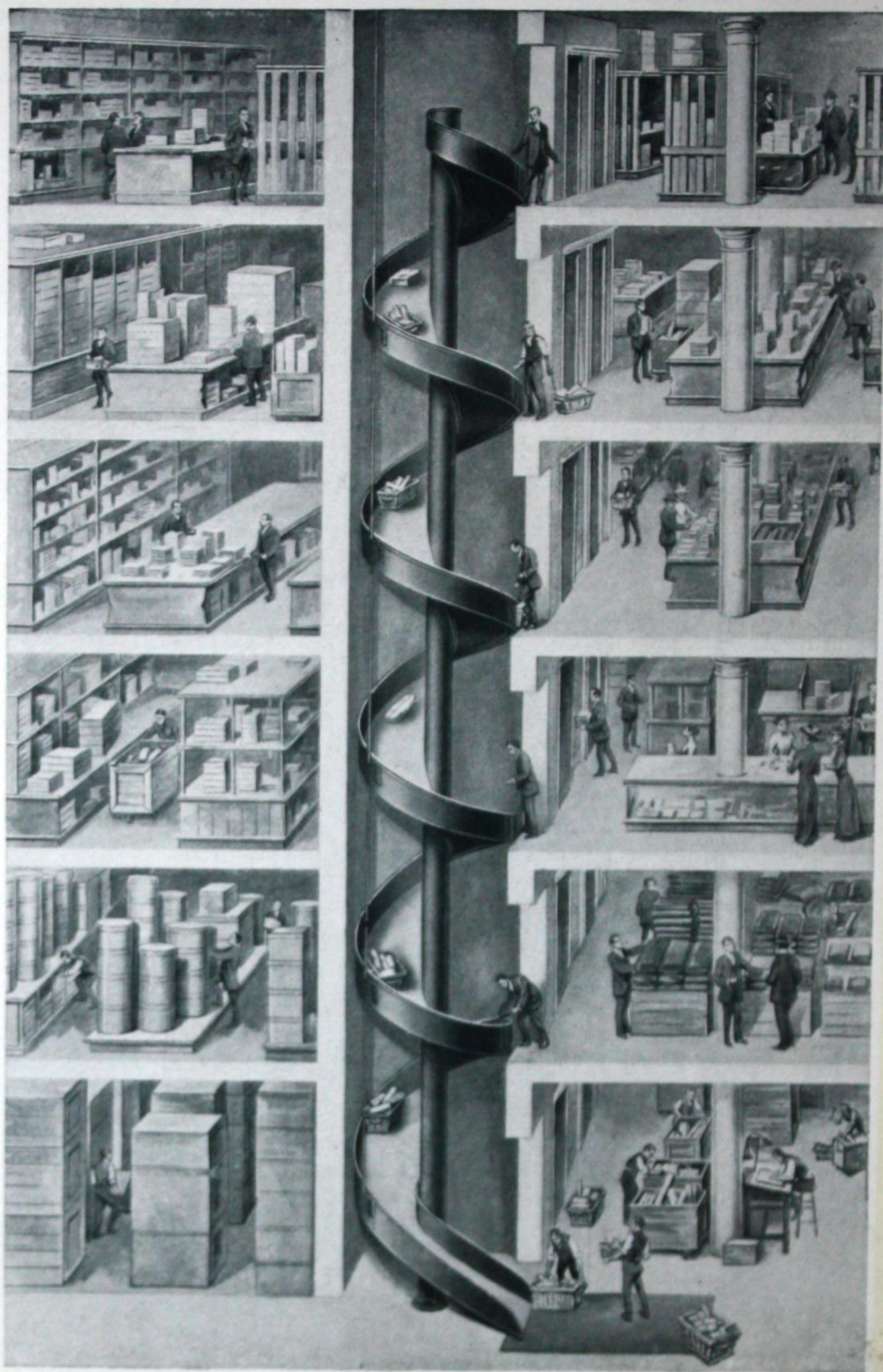
The choice of a type that will give the best results depends entirely upon the requirements of the user. Complete descriptions of each Conveyor and the purpose for which it is designed will be found in the following pages. Special attention is called to pages 36 to 53 containing descriptions of typical merchandise-handling systems in some of the numerous business houses where Otis Gravity Spiral Conveyors are used.

OPEN TYPE.

In a general way, it may be stated that the open type of Conveyor is particularly suitable for handling *heavy, bulky* merchandise, such as boxed and cased goods, wholesale and warehouse merchandise, factory products and the like. Even barrels of crockery and glass, packed in the usual way, can be safely conveyed in this manner. The inlets are located near the floor level, enabling goods to be placed on the Conveyor without being lifted.

CLOSED TYPE.

The closed type is usually recommended for handling a great variety of *small* articles such as packages in department and dry goods stores and small parcels of miscellaneous character. Heavy, compact merchandise, including boxed, cased and even barrelled goods, can also



Cross Section View showing Construction of Single Spiral Open
Type Conveyor with Supporting Core.

be handled satisfactorily with the closed type. Moreover, the use of this type precludes the possibility of strayed or stolen packages, an inconvenience which might occur in the handling of thousands of small packages on an open type conveyor.

GENERAL CONSTRUCTION.

Otis Gravity Spiral Conveyors are designed with a high factor of safety which allows for wear and which guarantees long life under severe and continuous usage. They are built entirely of heavy, high-grade sheet steel without a single weak spot, all parts being riveted firmly together to form a strong, rigid and permanent structure.

The Conveyors are temporarily assembled in the factory for inspection before shipment, but to avoid damage in transit are shipped knocked-down.

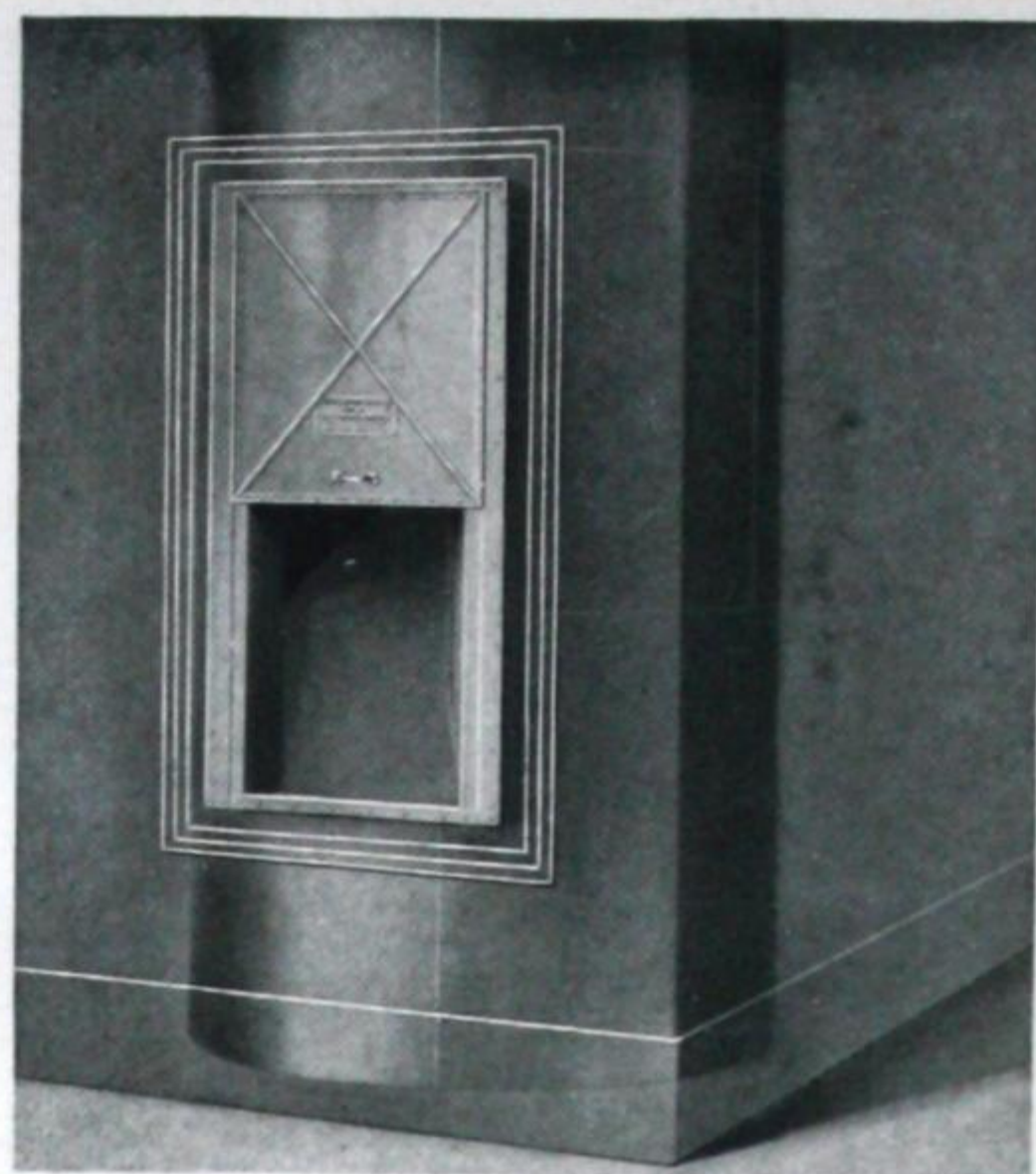
INLETS AND OUTLETS.

There are so many determining factors in locating the inlets and outlets at the various floors that no standard arrangement can be stated. A study of conditions enables us in every case to offer suggestions for an arrangement of spirals, inlets and outlets that will satisfactorily take care of delivery requirements.

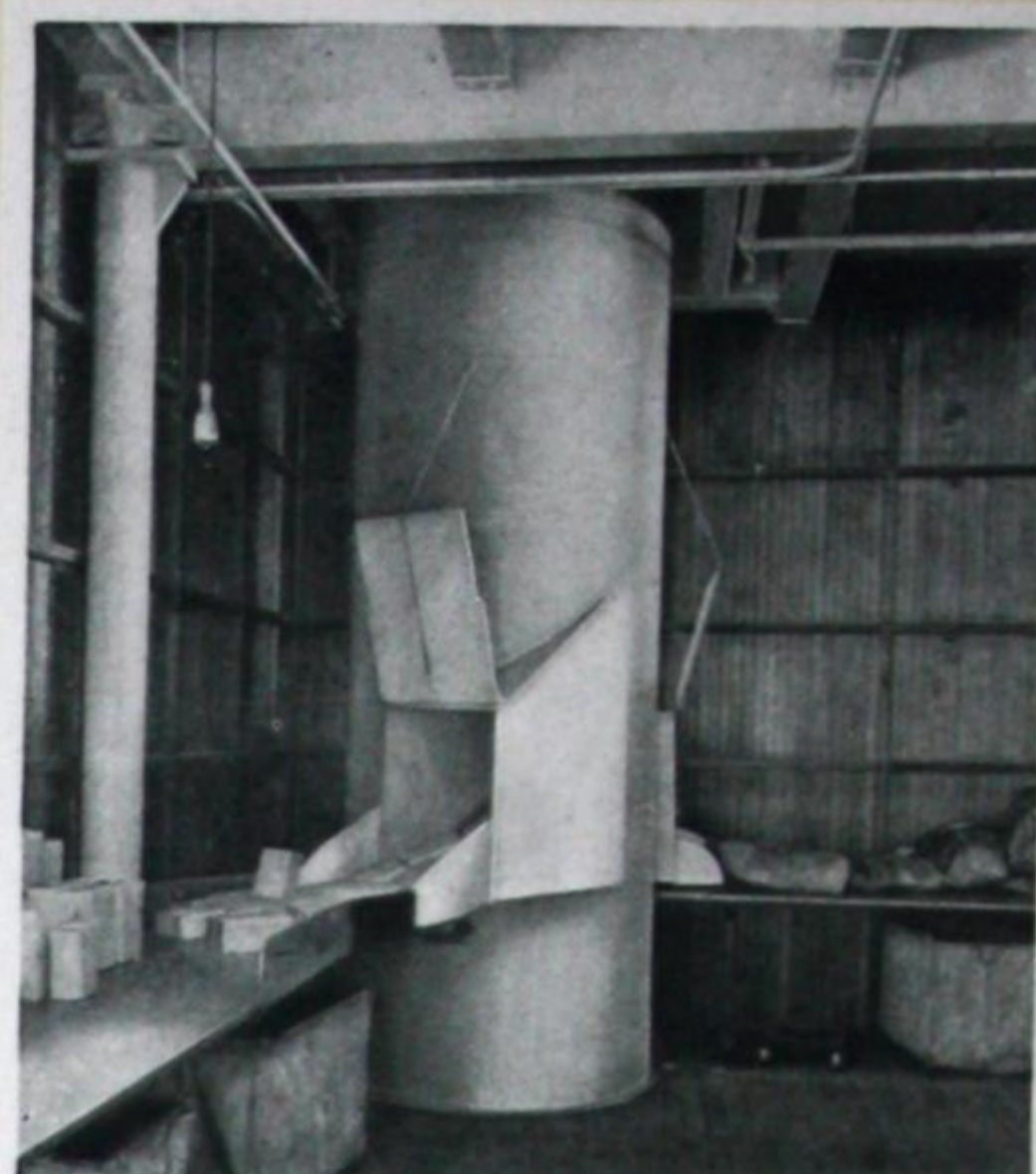
FIRE DOORS.

An important and unique feature of Otis Gravity Spiral Conveyors is the complete equipment of Automatic Fire Doors required, usually, by the local Board of Fire Underwriters. These fire doors are furnished in two designs, known as the vertical sliding and hinged types.

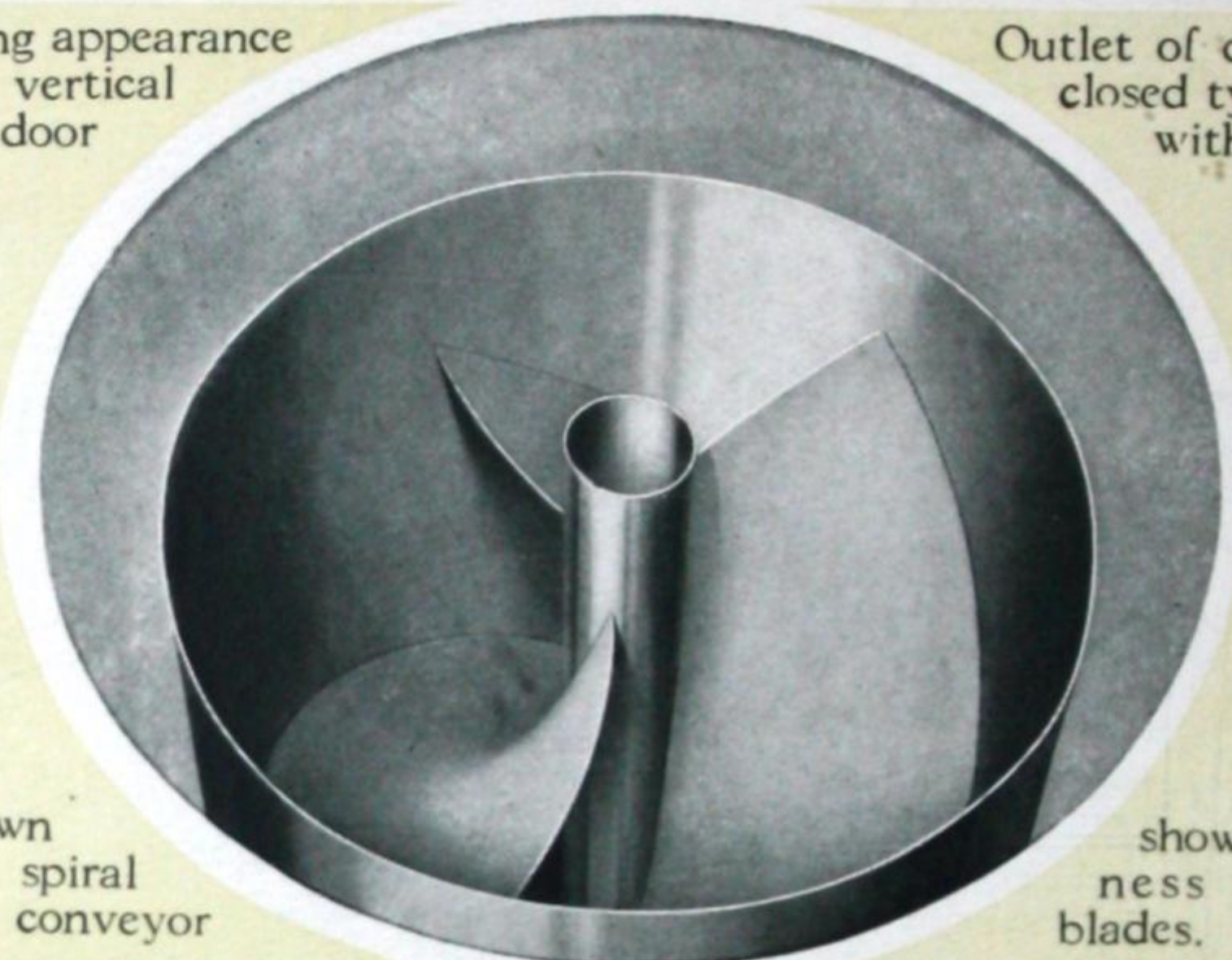
The vertical sliding fire door is used at all side inlets of the closed types of conveyors and at the intersection of all floors of the open types. When furnished for the closed types, the doors are so counterbalanced that while they can be easily raised, they will close unless fastened. This fastening consists of a latch and fusible link which melts in case of fire, releasing the door and allowing it to close. For the open types of conveyors, the doors are provided with a patented counterbalance made up in two sections, the total weight being such that, while the door can be moved easily, it will remain stationary at any point desired. In case of fire, the melting of the fusible link, which is located just



Inlet showing appearance of finished vertical sliding fire door open.

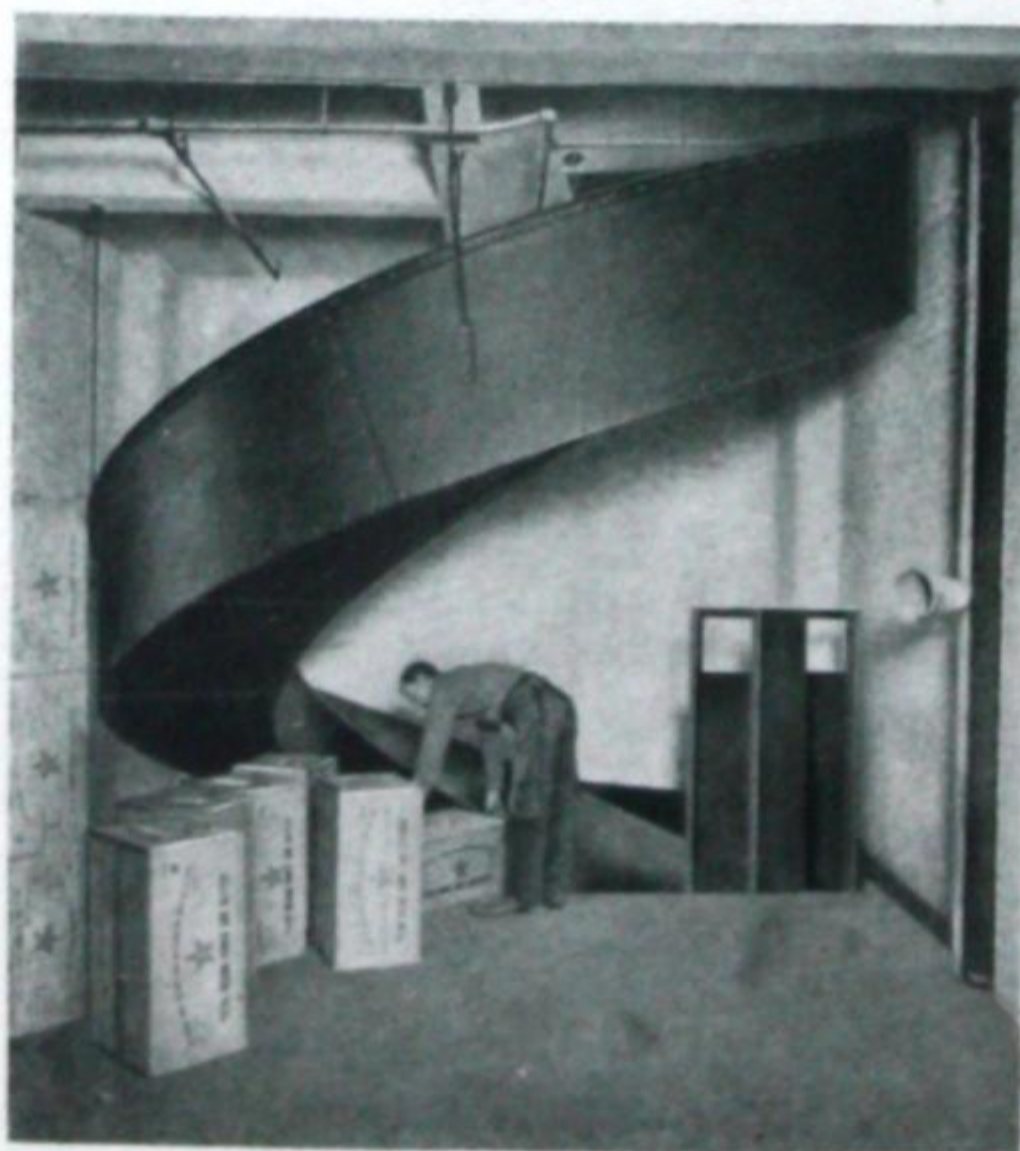


Outlet of double spiral closed type conveyor with hinged fire doors open.

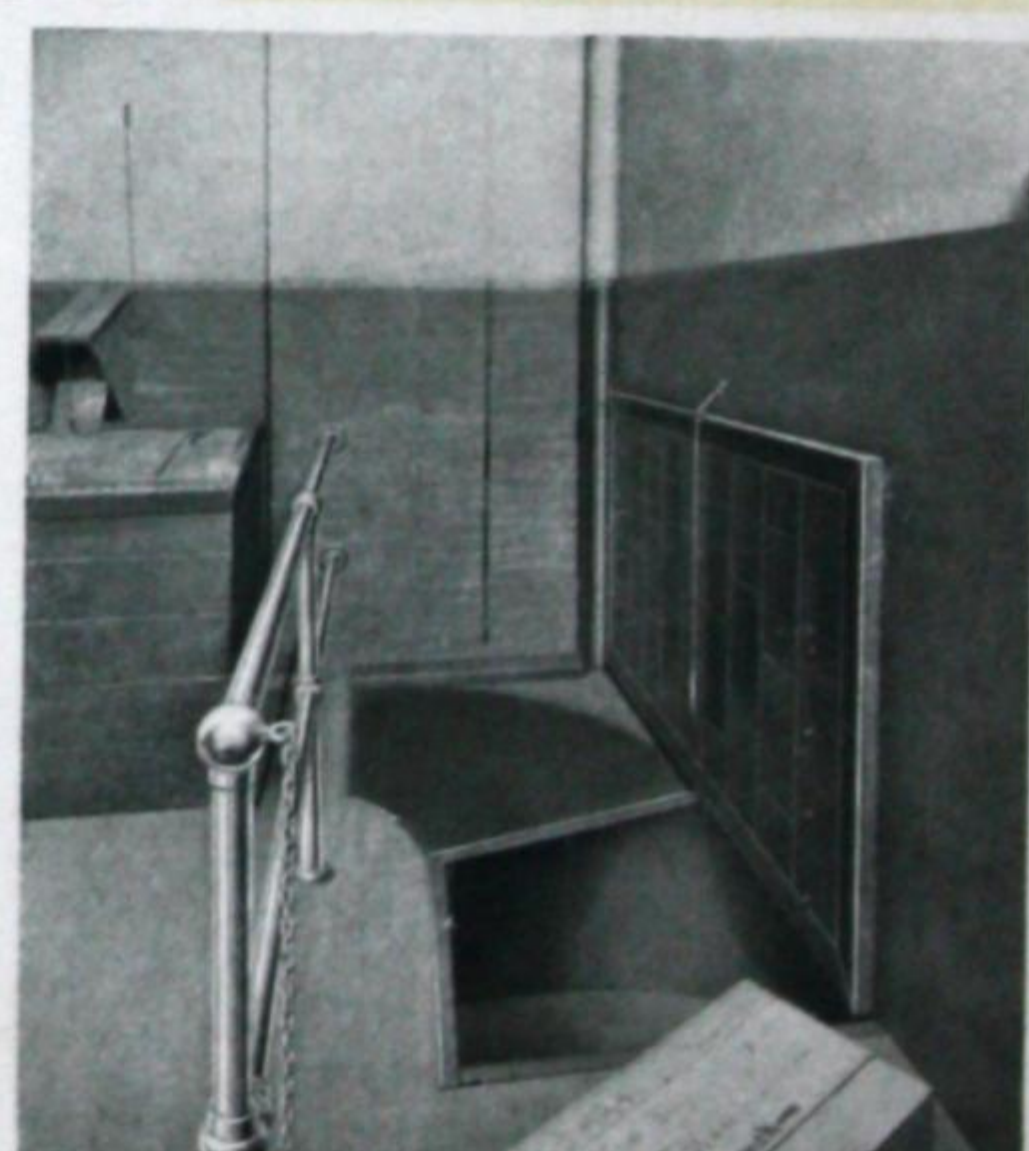


Looking down into triple spiral closed type conveyor

showing smoothness of spiral blades.



Method of locating vertical sliding fire doors at intersection of floors—open type conveyor.



Top inlet of single spiral open type conveyor. Hinged fire door in raised position.

below the floor opening, releases a part of the counterbalance, allowing the door to descend into the trough of the conveyor beneath the floor. This method of counterbalancing is especially good because the fusible links support only a small share of the total weight; hence the doors can be raised and lowered whenever desired without damage to the links.

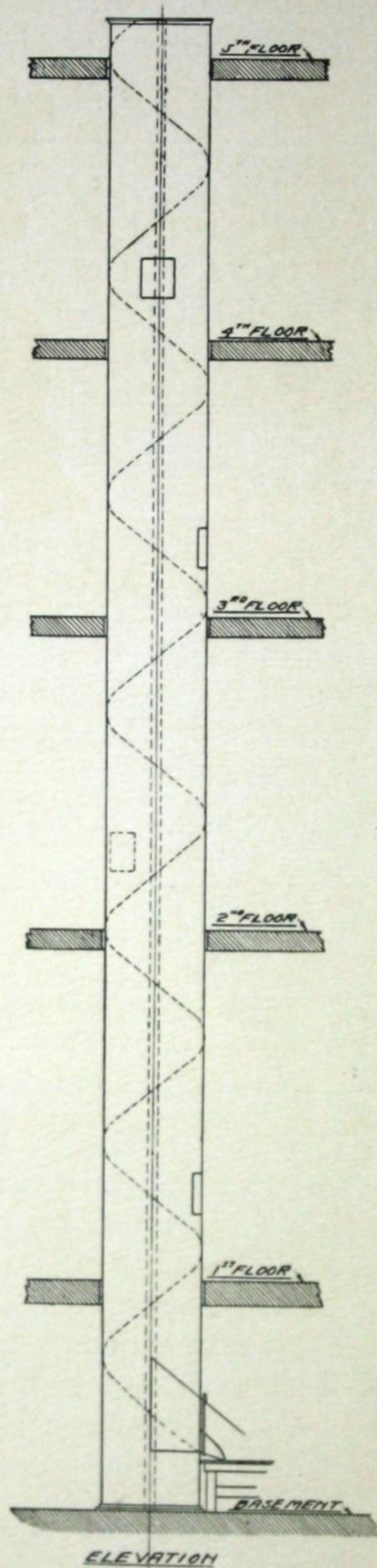
The hinged fire doors are usually furnished at the outlets of the closed types of conveyors and at the top inlets of both open and closed types. These doors are held open by a chain and fusible link, the link being placed close to the opening through which the fire would take its path, and the chain being fastened to the ceiling, a nearby wall or shell of the conveyor.

SWITCHOUT PLATES.

It is evident that a spiral can receive packages at as many floors as may be desired, but that unless some means are provided for deflecting the packages at intermediate floors it can discharge them at one point only, the outlet at the bottom of the conveyor.

In order to deflect packages from the spiral blade at floors above its bottom termination, Switchout Plates are used. These are of various designs according to the type of conveyor used, but all accomplish the same purpose, that is, they intercept the normal flow of the goods down the spiral and deposit the packages at the floors where the switchouts are in use.

There is a certain disadvantage in the use of switchout plates compared with the use of an independent spiral delivering to a certain floor, since the former must be placed in position whenever delivery to that floor is desired, while the latter is always ready, the desired delivery being obtained by merely loading packages into the proper inlets. A switchout system must be protected by interfloor signals. We, therefore, recommend the use of switchout plates only where a conveyor already has as many spirals as possible, and where delivery at intermediate floors is infrequently required.

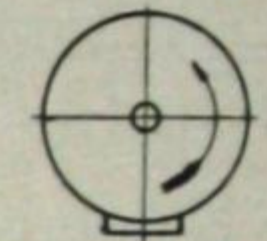


ELEVATION

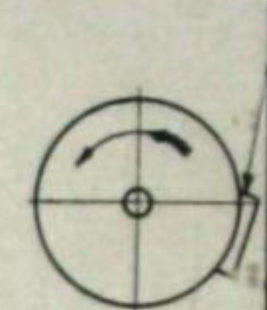
HINGED INLET DOOR



PLAN OF 5TH FLOOR



PLAN OF 4TH FLOOR



PLAN OF 3RD FLOOR

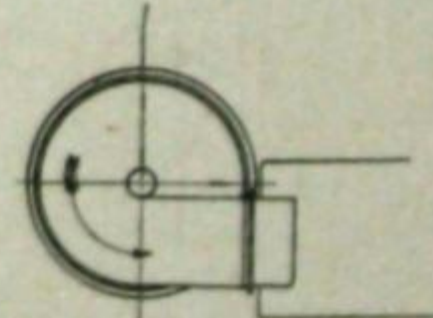
SLIDING INLET DOOR
SWINGING OUT AT 1ST, 2ND, & 3RD FLOORS



PLAN OF 2ND FLOOR

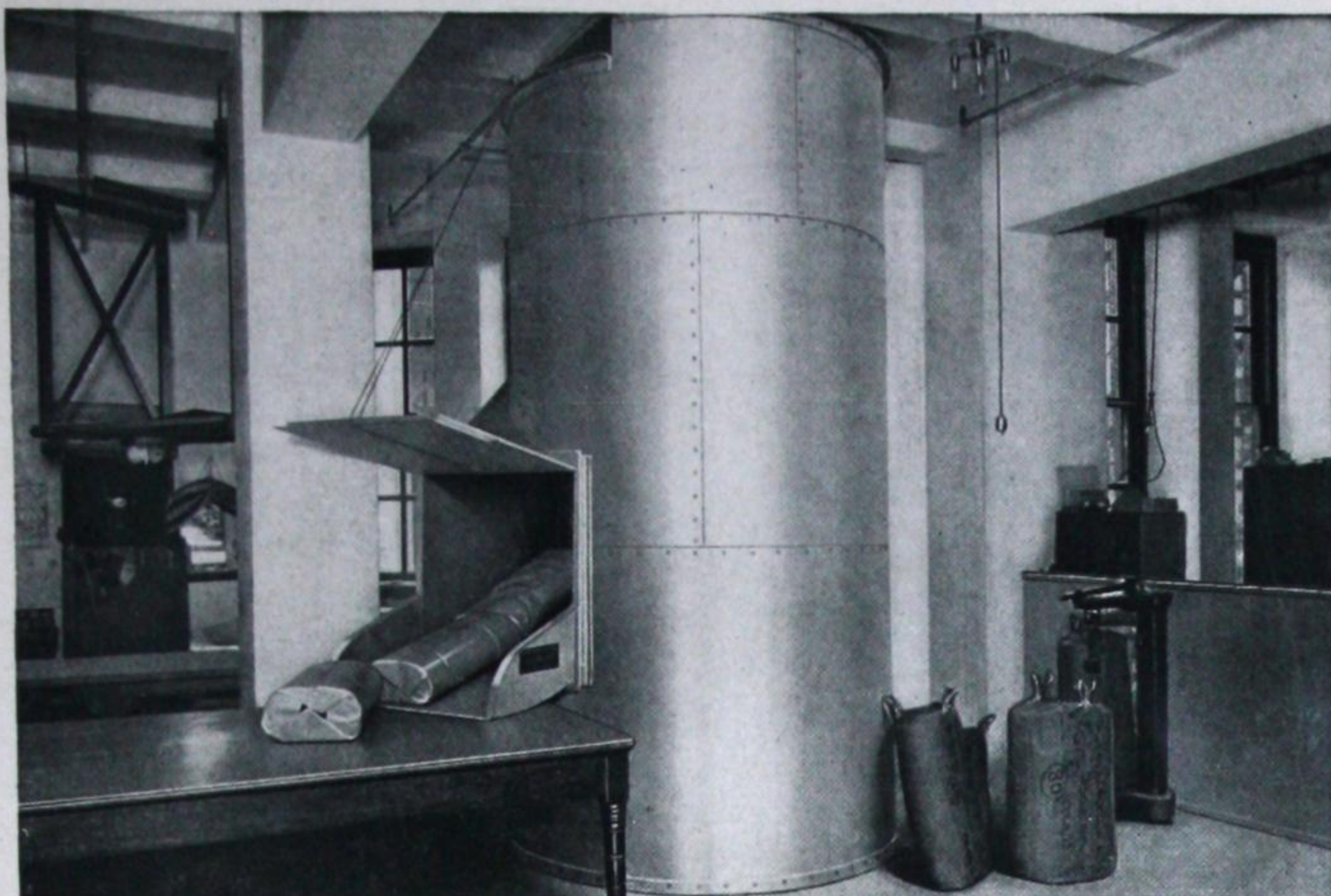


PLAN OF 1ST FLOOR



PLAN OF BASEMENT

Typical Layout of Single Spiral Closed Type Conveyor.



Otis Gravity Single Spiral Conveyor (Closed Type)
Hockanum Association, New York City.

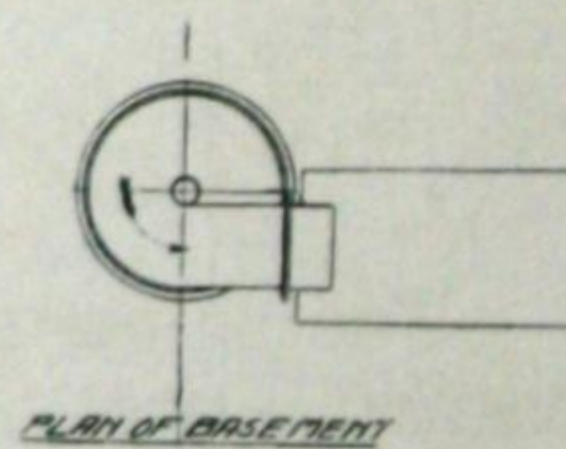
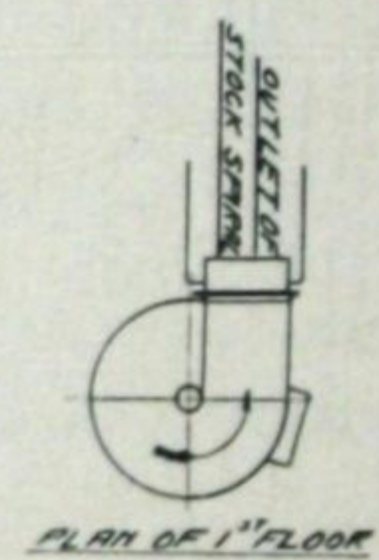
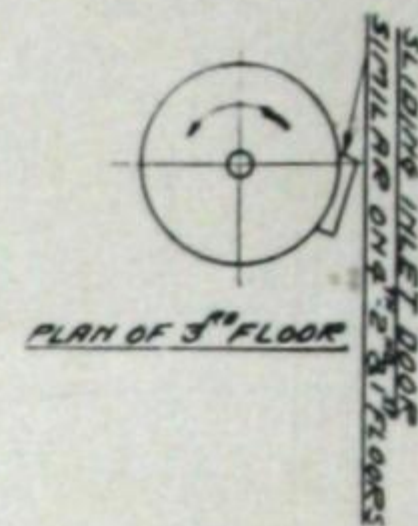
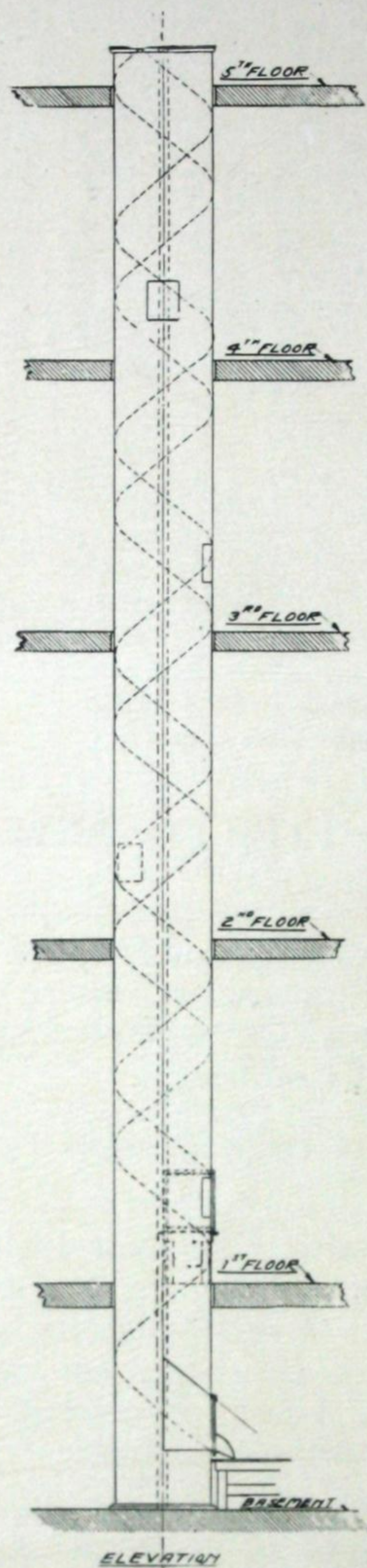
SINGLE SPIRAL CLOSED TYPE CONVEYOR

IN establishments where packages may be sent promiscuously to the shipping room regardless of the method and destination of shipment and where there is no need of separating different classes of packages, a single spiral Conveyor will usually suffice.

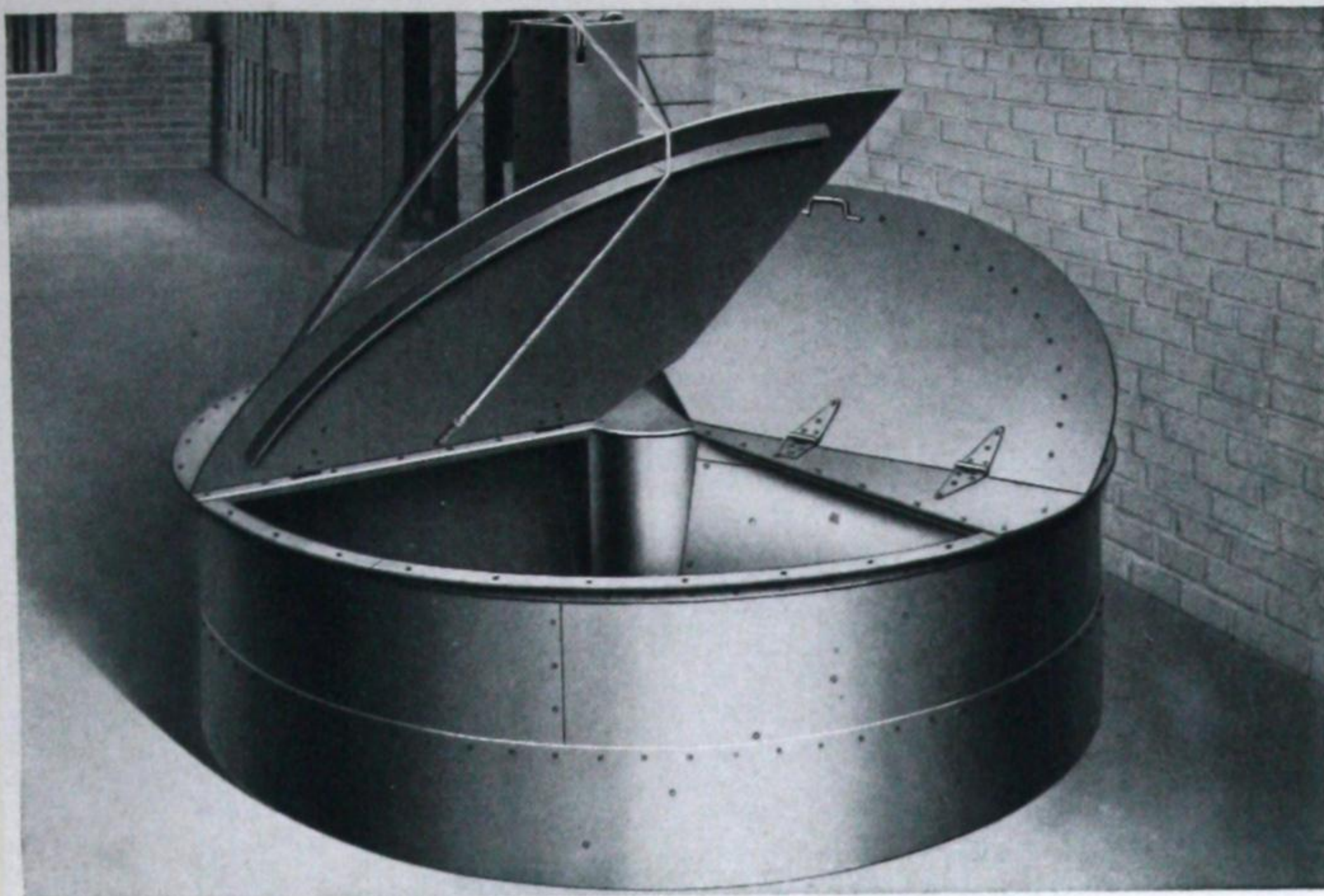
The layout on the opposite page shows a typical arrangement of this type.

It is often requested that this Conveyor be built to allow head room under the shell in the basement. In such a case the shell, instead of resting on the basement floor, is cut off just below the basement ceiling and is supported by a floor beam or column, the outlet, however, retaining its normal position.

The single spiral is the simplest form of the Otis Gravity Spiral Closed Type Conveyor, and has such a wide application that a place for it can be found in nearly every line of business to economically lower bags, packages, boxed, cased and barrelled goods or loose material in baskets.



Typical Layout of Double Spiral Closed Type Conveyor.



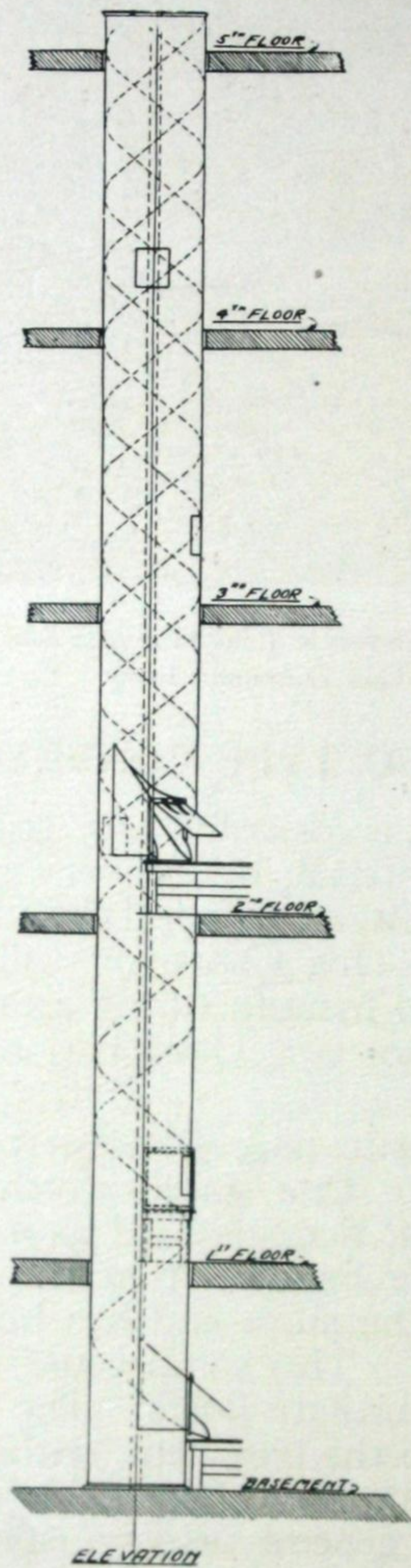
Otis Gravity Double Spiral Conveyor (Closed Type)
McFadden Coffee & Spice Co., Dubuque, Iowa.

DOUBLE SPIRAL CLOSED TYPE CONVEYOR

IN retail stores where it is desirable to separate packages by classes of material, by delivery routes or by express and parcel post, a two spiral closed type Conveyor is recommended. This Conveyor will also suffice in wholesale houses and manufacturing establishments where not more than two classifications are required.

The layout on the opposite page shows a typical arrangement for retail stores. One spiral, which runs from the fifth floor to the first floor, is used as a stock spiral for the delivery of merchandise from the stock room to the lower floors of the store and has but one inlet located at the fifth floor. This spiral could, if desired, have inlets at all intermediate floors. The spiral running from the fifth floor to the basement, with inlets at all floors and delivering upon a receiving table in the delivery room, is used as a general delivery spiral of "sold" packages.

The spirals in this Conveyor may be used in a number of different ways to meet the merchandise handling requirements of each business where it is to be installed.



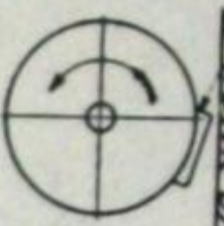
HINGED INLET DOORS AT TOP



PLAN OF 5th FLOOR



PLAN OF 4th FLOOR



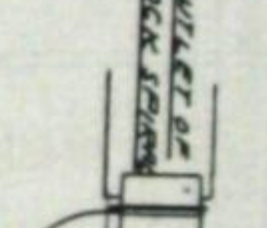
PLAN OF 3th FLOOR

SLIDING INLET DOOR
WITH DOOR ON 1st FLOOR

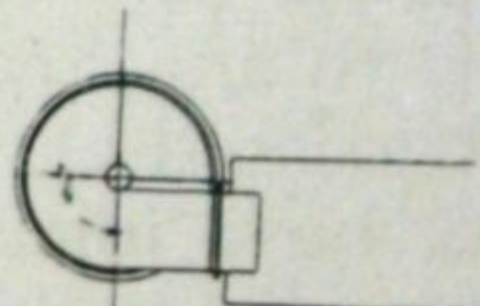


PLAN OF 2th FLOOR

OUTLET OF
STOCK SPIRAL



PLAN OF 1st FLOOR



PLAN OF BASEMENT

Typical Layout of Triple Spiral Closed Type Conveyor.



Otis Gravity Triple Spiral Conveyor (Closed Type)—Outlets in Basement
Mandel Brothers' Department Store, Chicago, Ill.

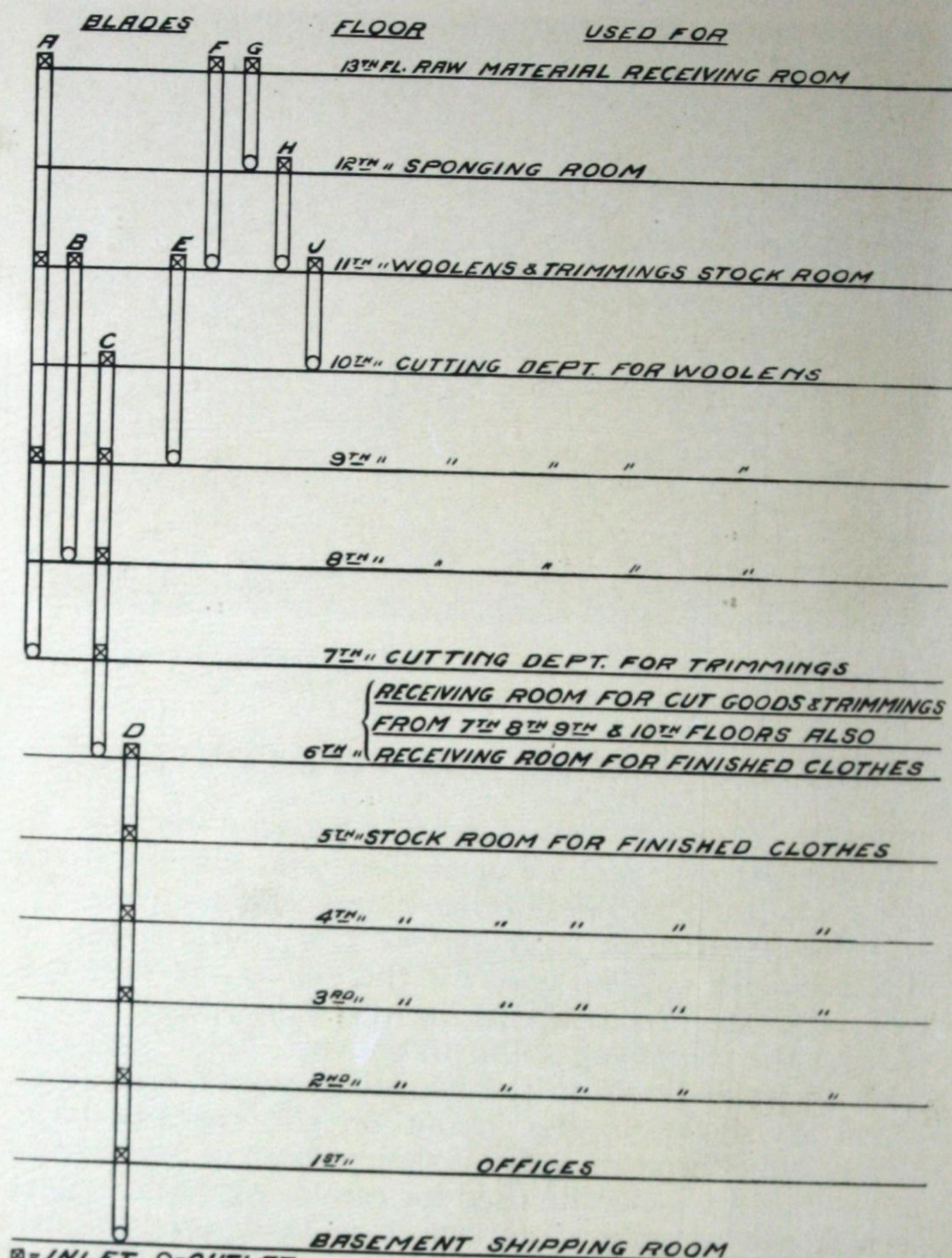
TRIPLE SPIRAL CLOSED TYPE CONVEYOR

THIS type of conveyor is especially efficient in department stores but is also used extensively in wholesale and mail order houses and factories.

For department store service two of the spirals in this conveyor may be used for the delivery of packages from the stockroom above to the sales floors below, leaving the remaining spiral to convey "Sold" packages from all sales floors to the assorting room in the basement, as shown in the layout on the opposite page. Where only one stock spiral is desired both of the remaining spirals are generally used for conveying "Sold" packages to the assorting room, one spiral being used to carry "Charge" and the other "C. O. D.," "Transfer" and "Paid" packages.

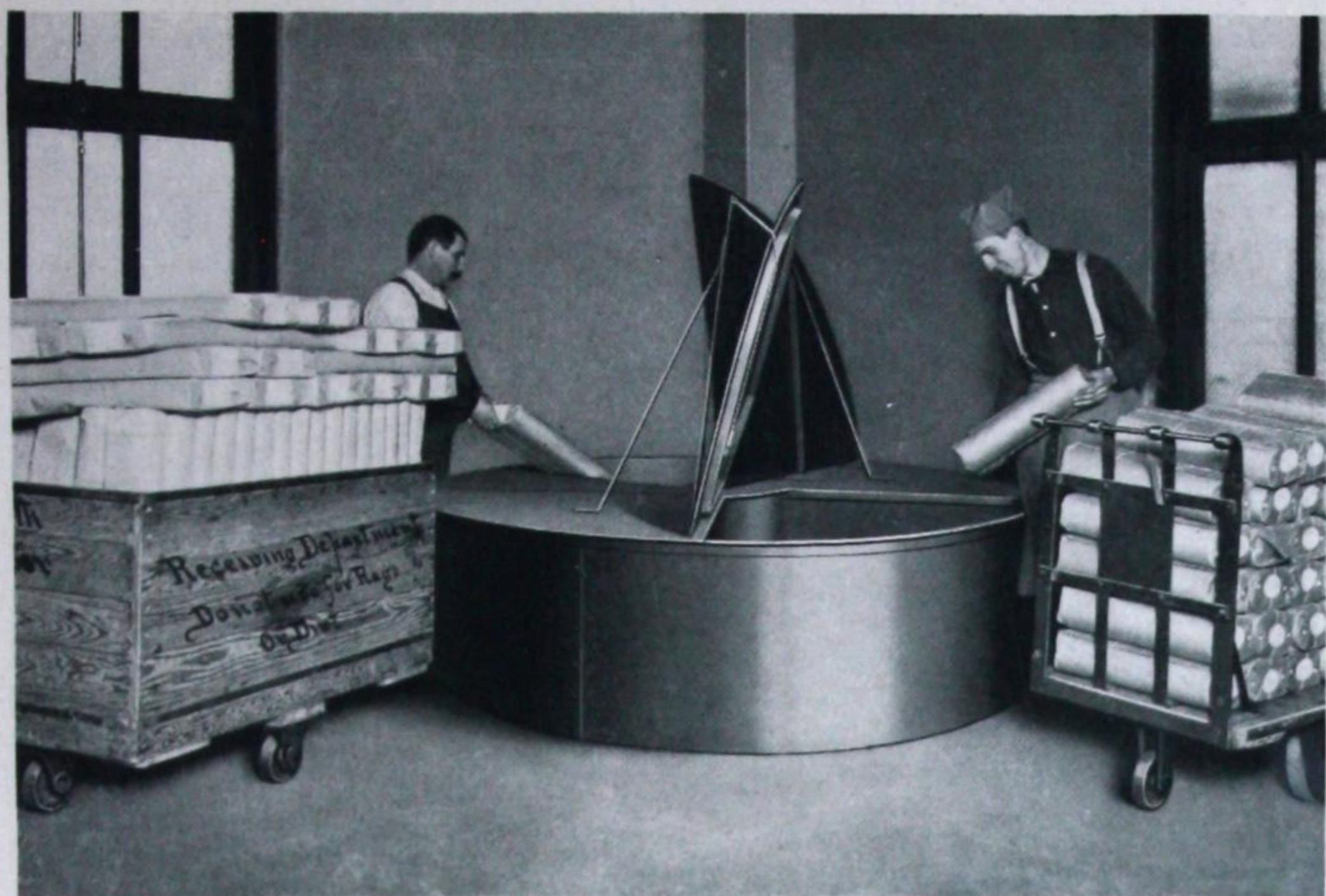
In wholesale houses this conveyor usually has an inlet to each spiral at all floors, with all outlets in the shipping room, the three spirals being used to separate city deliveries, out-of-town express shipments and out-of-town freight shipments.

In mail order houses this same type of conveyor is used to separate express, parcel post and freight shipments.



@ = INLET O = OUTLET
 BLADES "A" TO "F" INCLUSIVE ARE ALL CONTAINED IN THE ONE CYLINDRICAL SHELL. THE SHORT BLADES "G" "H" & "U" ARE STRAIGHT SLIDES RUNNING FROM FLOOR TO FLOOR

Diagram showing arrangement of Spiral blades in Multi-Spiral Closed Type Conveyor at factory of Hart, Schaffner & Marx, Chicago, Ill.



Otis Gravity Multi-Spiral Conveyor (Closed Type)
Hart, Schaffner & Marx, Chicago, Ill.

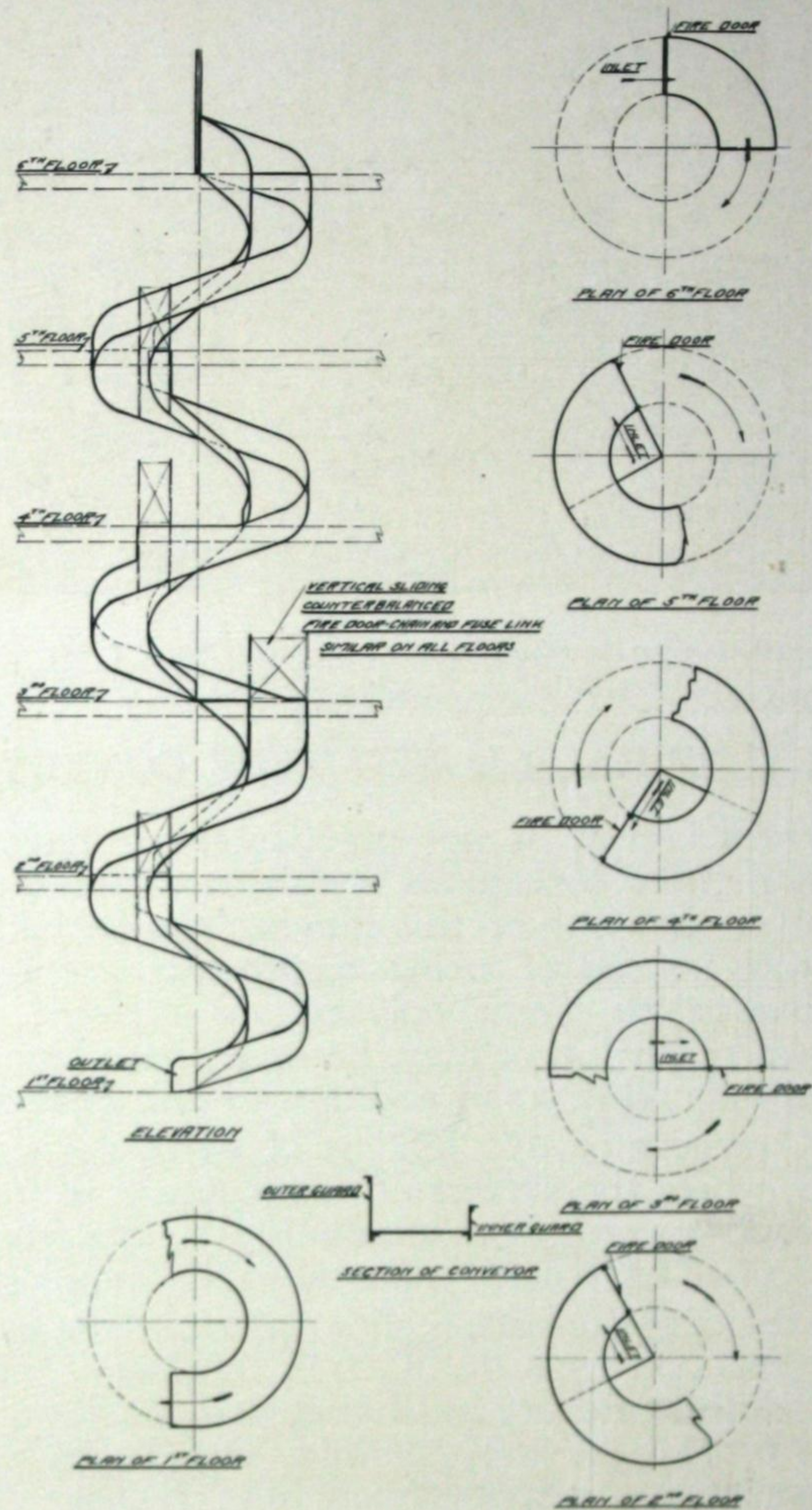
MULTI-SPIRAL CLOSED TYPE CONVEYOR

ALTHOUGH it is not practicable to have more than three continuous spirals in a Gravity Conveyor, more than this number can be had when the spirals, instead of being continuous, are built in short blades to serve only certain adjacent floors. Conveyors of this type may, however, have one or two spirals serving all floors, in addition to the short spirals.

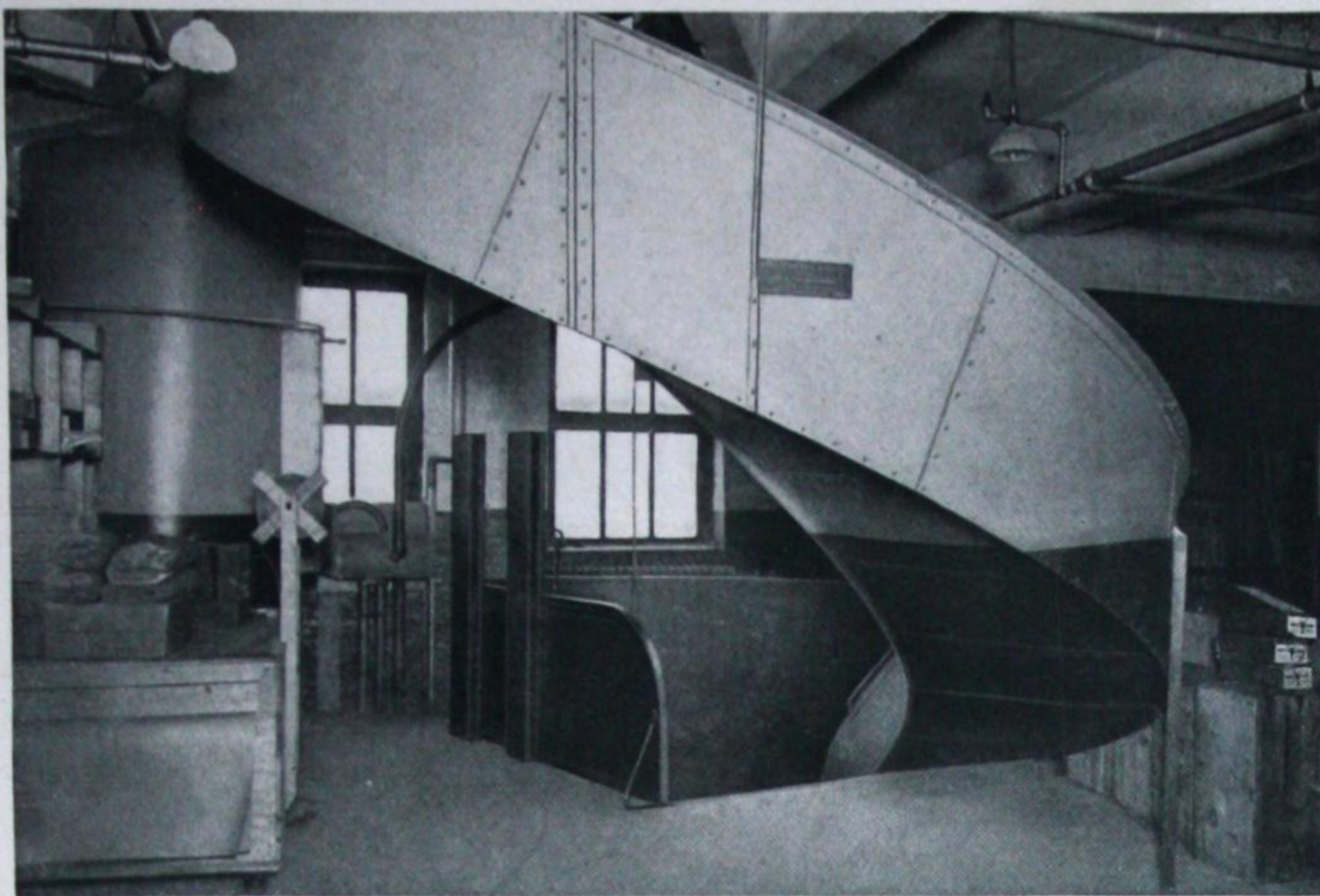
A Conveyor of this kind is of particular value in factories, where the process of manufacture is from the top floor downward, to take unfinished parts from floor to floor as well as to carry material to the shipping room.

On the opposite page is shown diagrammatically the multi-spiral Conveyor installed in the Hart, Schaffner & Marx clothing factory in Chicago and the floors served by each blade. (X indicates inlet--O indicates outlet.) This installation is described more fully on pages 38 to 40. With the exception of the short spirals this Conveyor is similar to the triple spiral closed type Conveyor.

Various combinations of these spirals may be made to conform to practically every desired method of package handling.



Typical layout of Single Spiral Open Type Conveyor without Supporting Core.



Otis Gravity Single Spiral Conveyor (Open Type) Without Supporting Core
Baltimore Bargain House, Baltimore, Md.

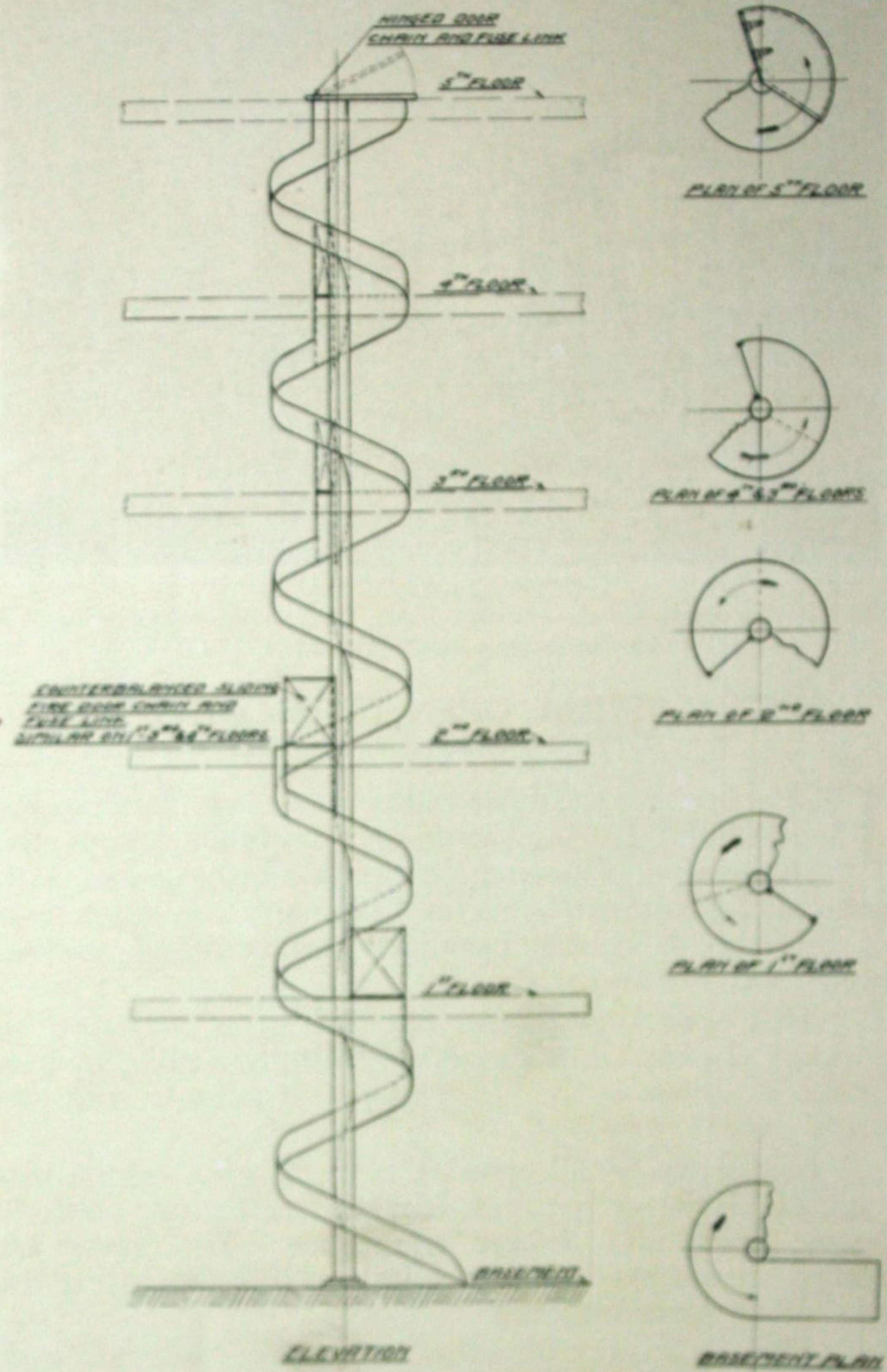
SINGLE SPIRAL OPEN TYPE CONVEYOR WITHOUT SUPPORTING CORE

FOR handling the more bulky classes of merchandise in manufacturing plants and wholesale houses, the large sizes of open type Conveyors have met with great success and are being used extensively in many lines of business to handle packages and boxes of various kinds, weights and sizes.

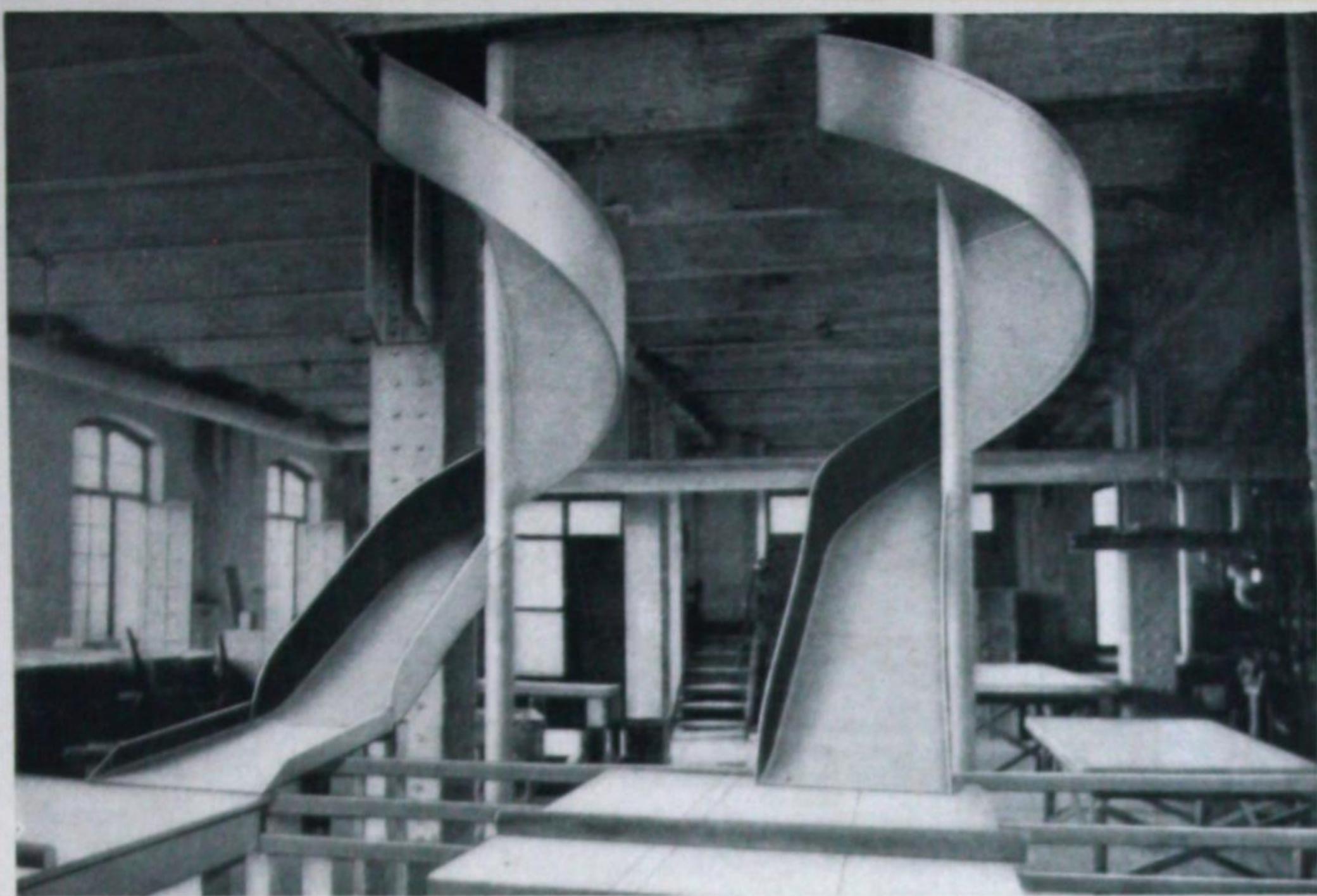
This open type Conveyor, having no enclosure to support the blades, is supported from the ceiling by iron braces as shown in the illustration. It is built with one spiral only.

Notice the small amount of floor space which this type of Conveyor requires, leaving free for use valuable space under and around the blade. The inlets are placed on the inside of the spiral, further decreasing the amount of space required.

This type of Conveyor is usually equipped with Otis patented vertical sliding fire doors to close up the floor openings in case of fire. However, in case the local authorities do not require these doors they may be omitted.



Typical layout. Single Spiral Open Type Conveyor with Supporting Core.



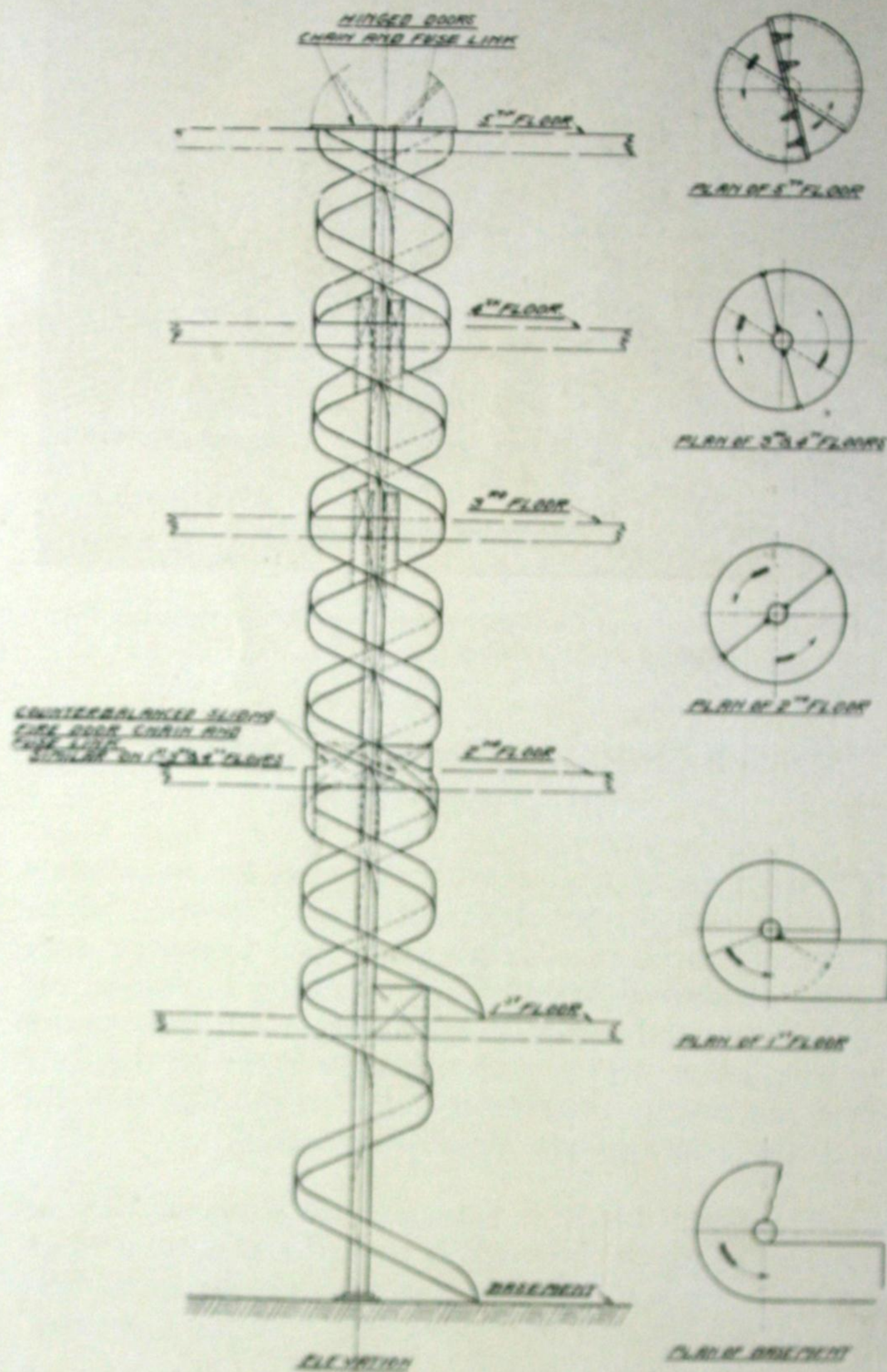
Otis Gravity Single Spiral Conveyors (Open Type) With Supporting Core
Federal Sugar Refining Co., Yonkers, N. Y.

SINGLE SPIRAL OPEN TYPE CONVEYOR WITH SUPPORTING CORE

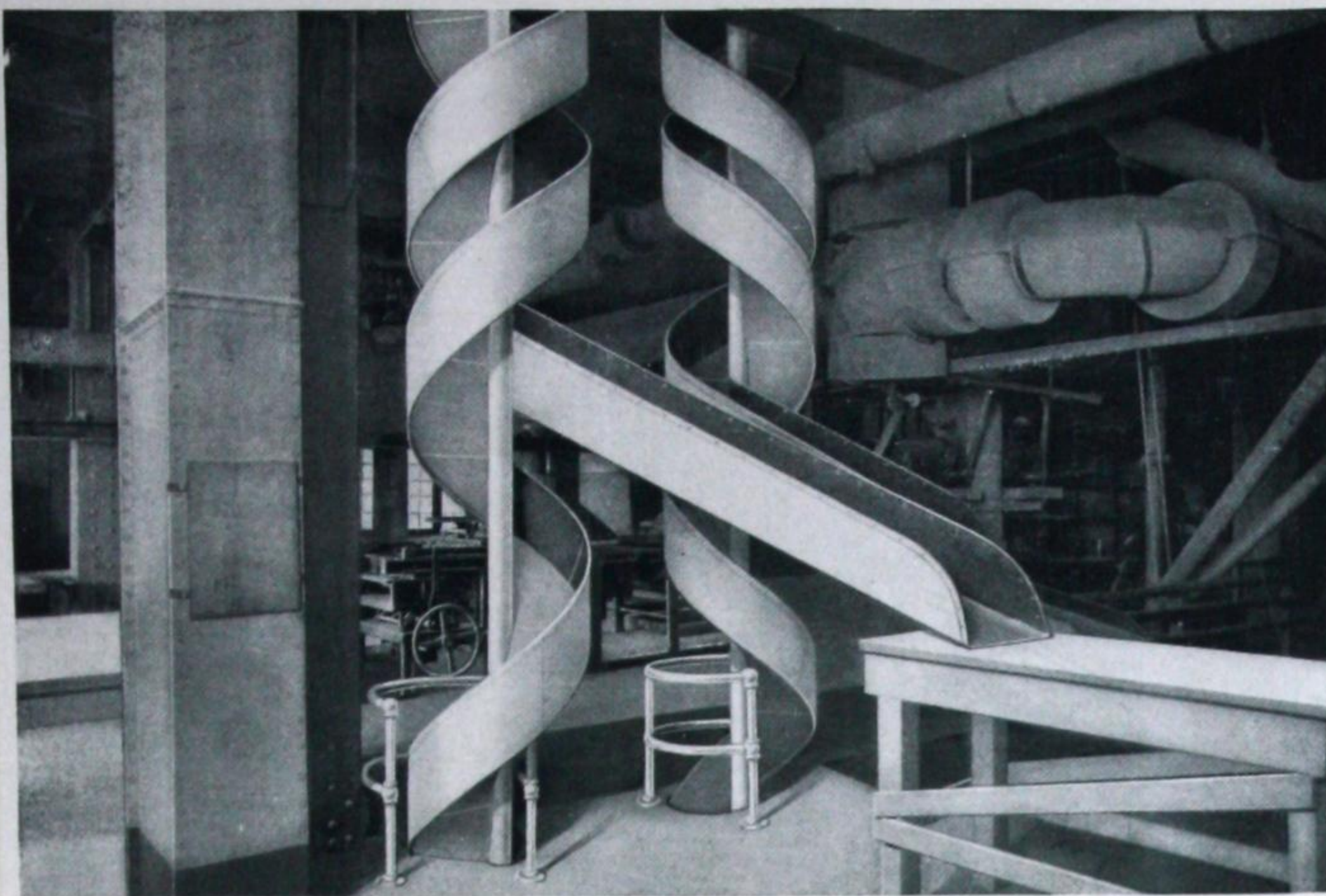
THIS type of Conveyor is designed for installation in closed or open shafts, or in any location where for various reasons a closed type Conveyor may not be considered desirable. In existing buildings, old dumbwaiter and elevator shafts are often utilized for the installation and in such cases fire doors on the Conveyor are usually unnecessary, due to the fact that the hatchway openings are already protected.

The spiral blade is substantially supported by an iron core to which the blade is riveted and around which it describes a spiral. This core rests on the lower floor and extends upward the entire length of the Conveyor.

In loading goods upon this type of Conveyor, the packages are lifted over the outside guard and placed directly upon the spiral blade.



Typical Layout, Double Spiral Open Type Conveyor, with Supporting Core.



Otis Gravity Double Spiral Conveyors (Open Type) With Supporting Core
Federal Sugar Refining Co., Yonkers, N. Y.

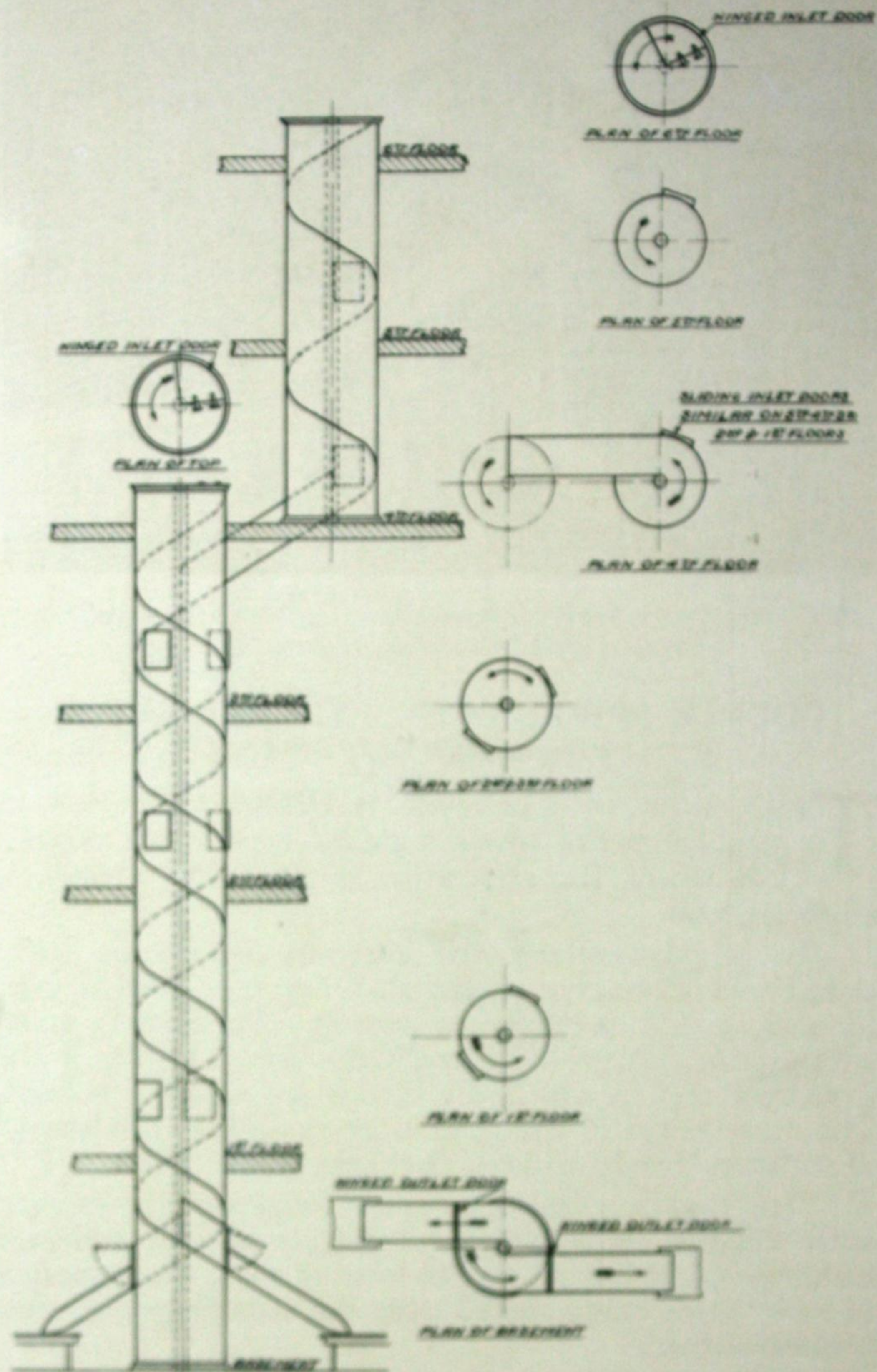
DOUBLE SPIRAL OPEN TYPE CONVEYOR WITH SUPPORTING CORE

THIS type of Conveyor is designed for use in establishments where a closed type is not desired but where the separation of goods by classes is advantageous.

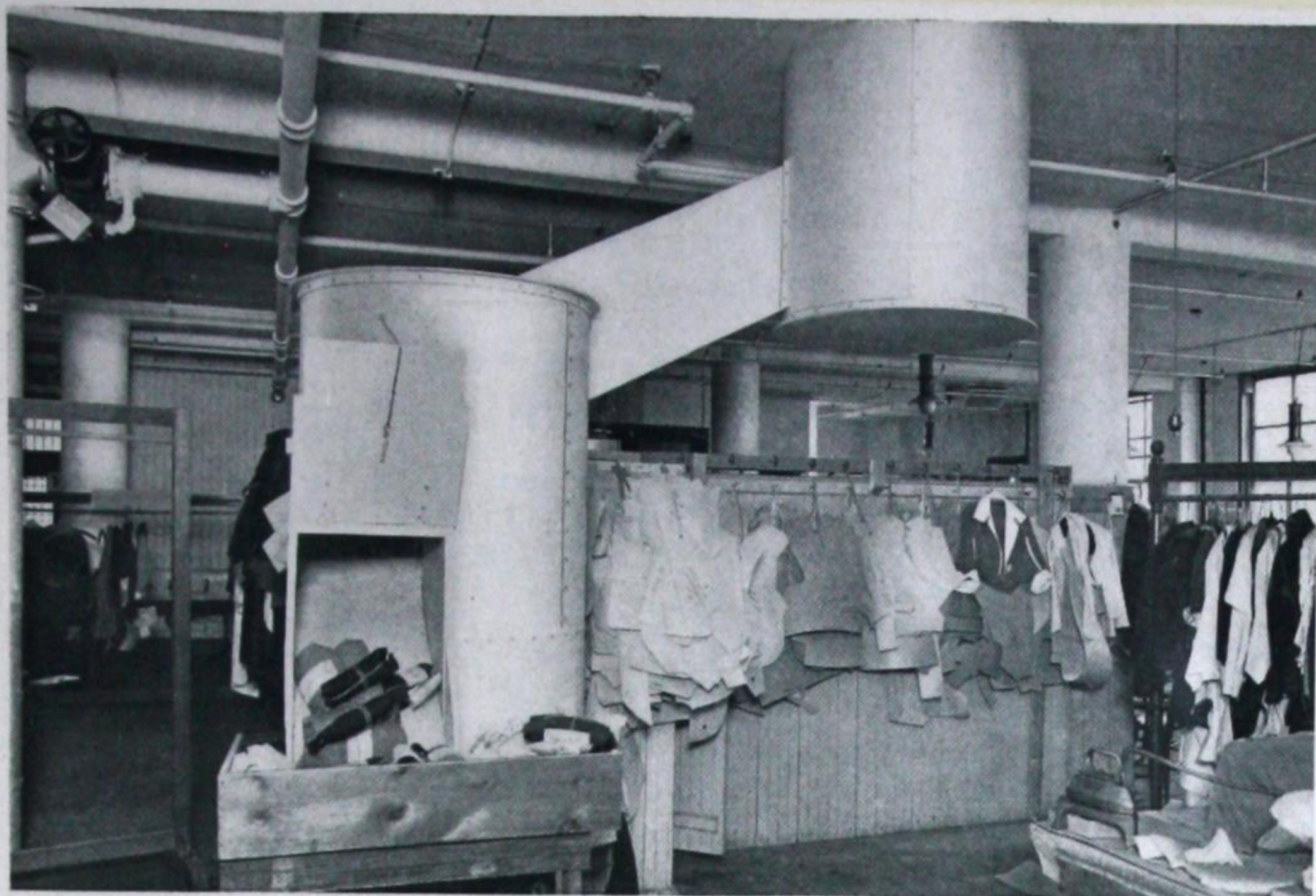
It is substantially the same as the double spiral closed type Conveyor except that no outer shell is used to enclose and support the spirals. Support is given by the iron core which extends the entire length of the Conveyor and to which the blades are securely riveted. The outer edges of the spirals are provided with guards of sufficient height to keep packages on the blade.

The double spiral open type Conveyor may be used with various combinations of spirals to suit different conditions. It has no special form of inlet, the packages in most cases being placed over the outside guard upon the spiral blade.

The layout on the opposite page shows a Conveyor of this type with two spirals beginning at the fifth floor, one delivering at the first floor and the other in the basement. Both spirals have inlets at all intermediate floors.



Typical Layout—Closed Type Interlocking Conveyor.



Otis Gravity Single Spiral Interlocking Conveyor (Closed Type)
A. Beller & Co., New York City.

INTERLOCKING CONVEYORS

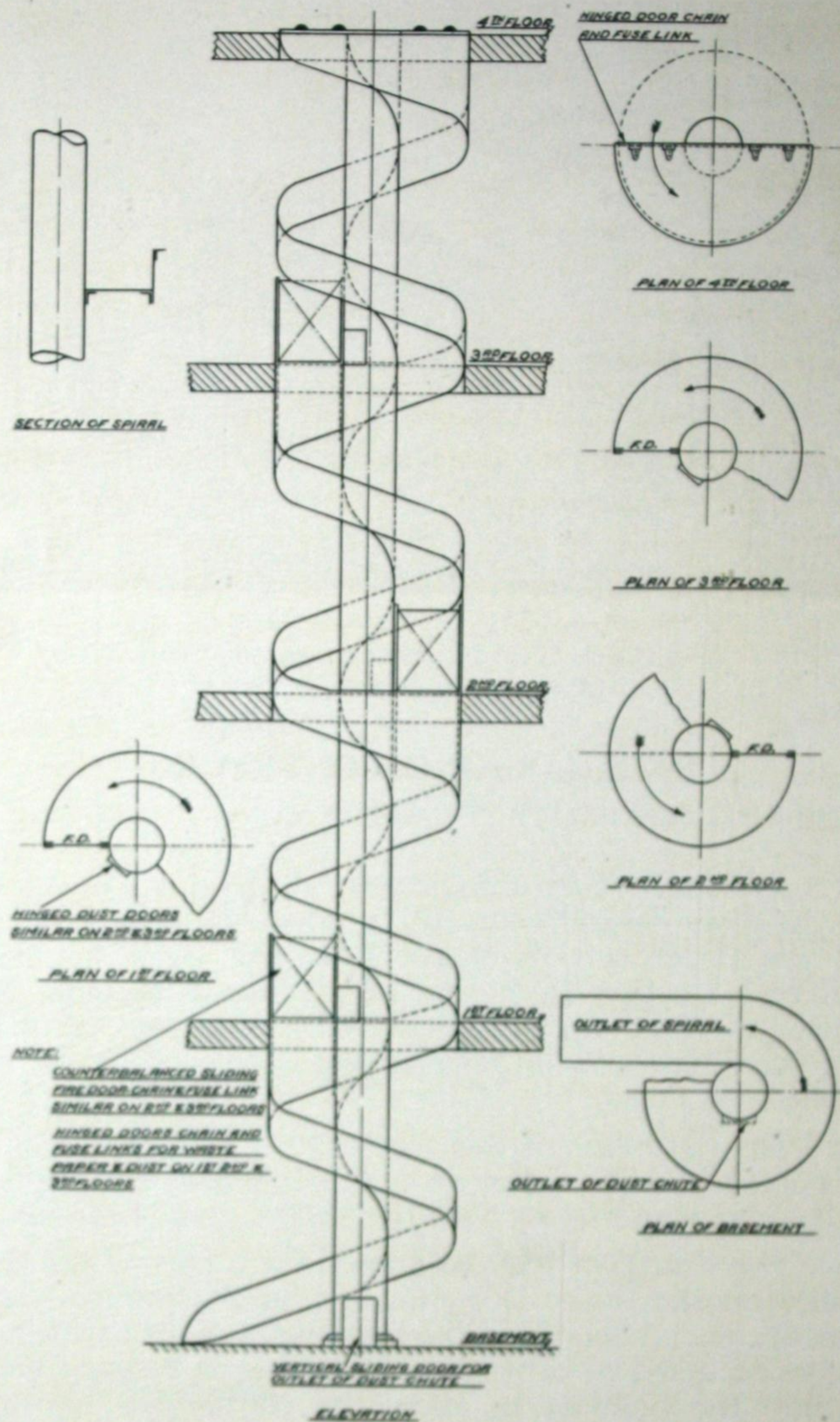
SHOWING FLEXIBILITY OF GRAVITY CONVEYOR SYSTEMS

IN buildings where a single spiral Conveyor will suffice to serve several consecutive upper floors and where the upper section of the Conveyor must be in a different location from that of the lower section, the packages, however, to be delivered to the same point in the shipping room, an interlocking Conveyor can be installed.

The flexibility of this interlocking system makes it possible to install conveyors in almost any existing building without interfering with line shafts, partitions, etc.

The Conveyor may be carried for a part of the distance on the inside of a building in the regular way, then extended outside of the building in order to encircle floors occupied by other tenants and again brought back within the building to allow the conveyance of merchandise through inlets at all floors below.

This interlocking feature can be used with both open and closed types of conveyors.



Typical Layout—Combination Single Spiral Conveyor and Dirt Chute.

COMBINATION SINGLE SPIRAL CONVEYOR AND DIRT CHUTE

THIS type of Conveyor is designed especially to provide a quick and economical means of sending waste and dirt from all floors of a building directly to the basement as well as to convey merchandise to the shipping room.

It is essentially nothing more than an open type conveyor with a core large enough to carry the refuse. Goods can be loaded upon the spiral blade at all floors, while the hollow core, provided as it is with inlets at each floor, is used exclusively for dirt and waste which is removed from time to time through a door at the bottom.

By making one shaft serve two distinct purposes, maximum efficiency and economy is obtained from this type of Conveyor. It is useful in wholesale houses, factories and retail stores where only one spiral blade is needed to carry merchandise, and where favorable conditions exist for locating this type of Conveyor.

Still another type of Conveyor known as a Waste Chute is frequently used by concerns which may not require the merchandise spiral delivery feature but which have considerable waste paper and rubbish accumulation on the upper floors, for conveying this waste material directly into a bin at the first floor or basement. Such a chute may be advantageously placed on the outside of a building.

For this work a cylindrical shell without spiral blades is furnished with inlet doors of either the vertical sliding or hinged type placed at every floor. The top of the chute is usually extended above the roof for purposes of ventilation.

TYPICAL DELIVERY ROOM PLANS

FOLLOWING are several suggestions for the efficient arrangement of delivery rooms where Otis Gravity Spiral Conveyor systems of merchandise delivery are used. In these plans the type of conveyor as well as the number and arrangement of spirals has been disregarded, the description being confined merely to the arrangement of the delivery room. Typical layouts of the conveyors themselves, single, double, triple and multi-spiral, are illustrated and described on preceding pages.

The two diagrams at the top of page 30 illustrate a typical delivery room arrangement for a small store, in this particular case a double spiral conveyor being used. One spiral ends on the sorting table in the delivery room, which is located in the basement. All goods which are to be delivered by wagon, parcel post or express are sent down this spiral to the sorting table, where they are sorted according to routes and methods of delivery.

The other spiral is used for goods purchased on transfer cards. Those purchased on a "will-take" transfer are placed together in a bin and when the last purchase has been made are wrapped and delivered to the customer. Articles purchased on a "send" transfer are wrapped and placed on the delivery room spiral, on which they are conveyed to the delivery room in the basement.

At the bottom of page 30 is a delivery room arrangement for a larger store. As shown it provides bins for 10 drivers but this can be increased to meet conditions. In this case the large number of local routes requires that the express, parcel post and special delivery parcels be handled in a separate room.

Parcels to be delivered by wagon are received by the sorters and routers who mark the route on each parcel and place it in the corresponding sheet writer's bin. The sheet writer, after entering the articles on his sheet, places them in the drivers' bins.

An arrangement for the delivery room of a large department store is illustrated by the upper diagram

on Page 31. All packages to be delivered are sent down on one of the Gravity Spiral Conveyor blades and discharged at one central point, whence they are moved on a belt conveyor (see pages 32-33) to the receiving table.

If the parcels are marked for delivery they are placed on a belt conveyor, from which they are picked by the sorters.

Packages to be delivered by express, parcel post or special delivery are placed on one side of a divided belt, which discharges them into a room set apart for this class of goods.

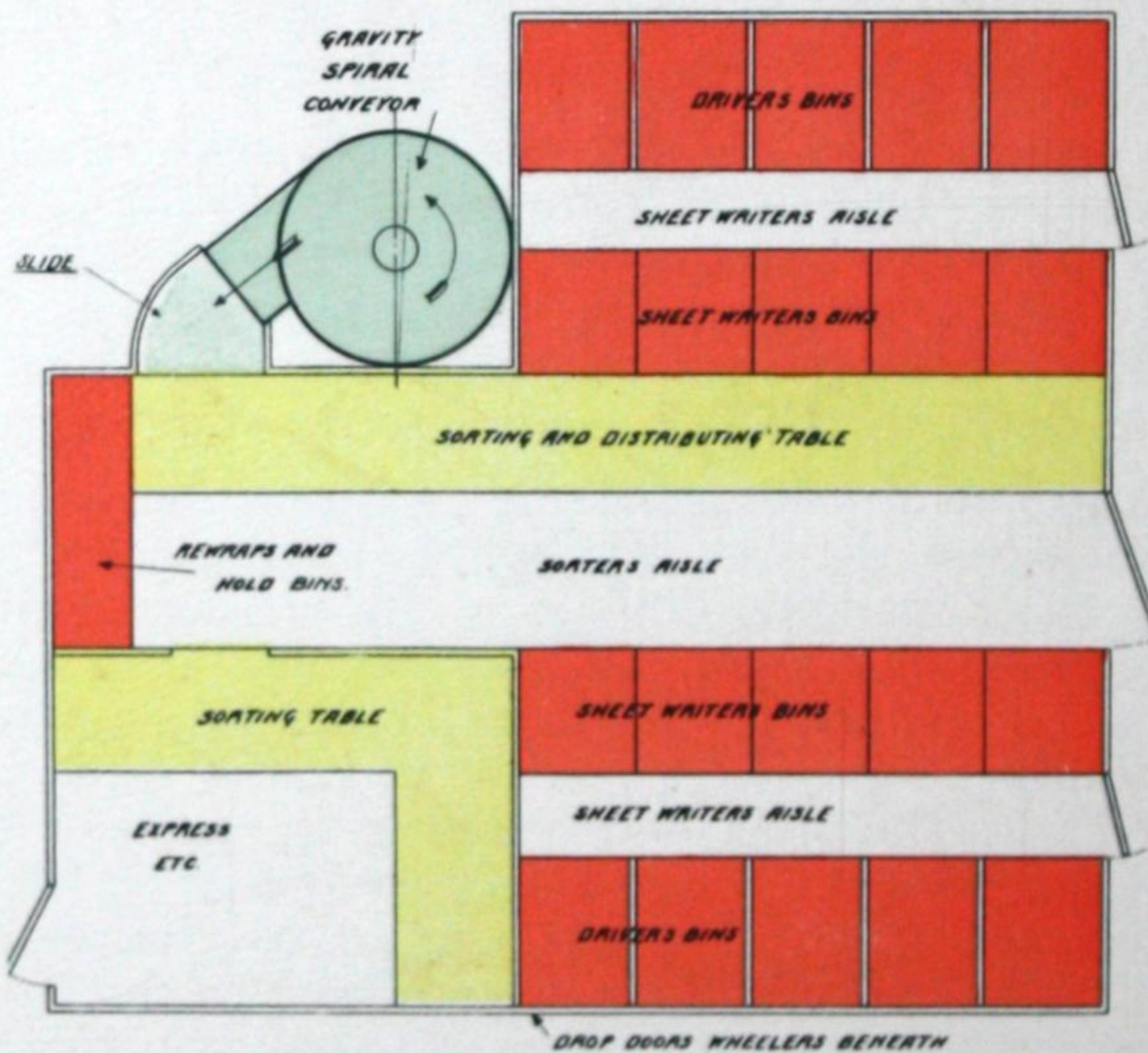
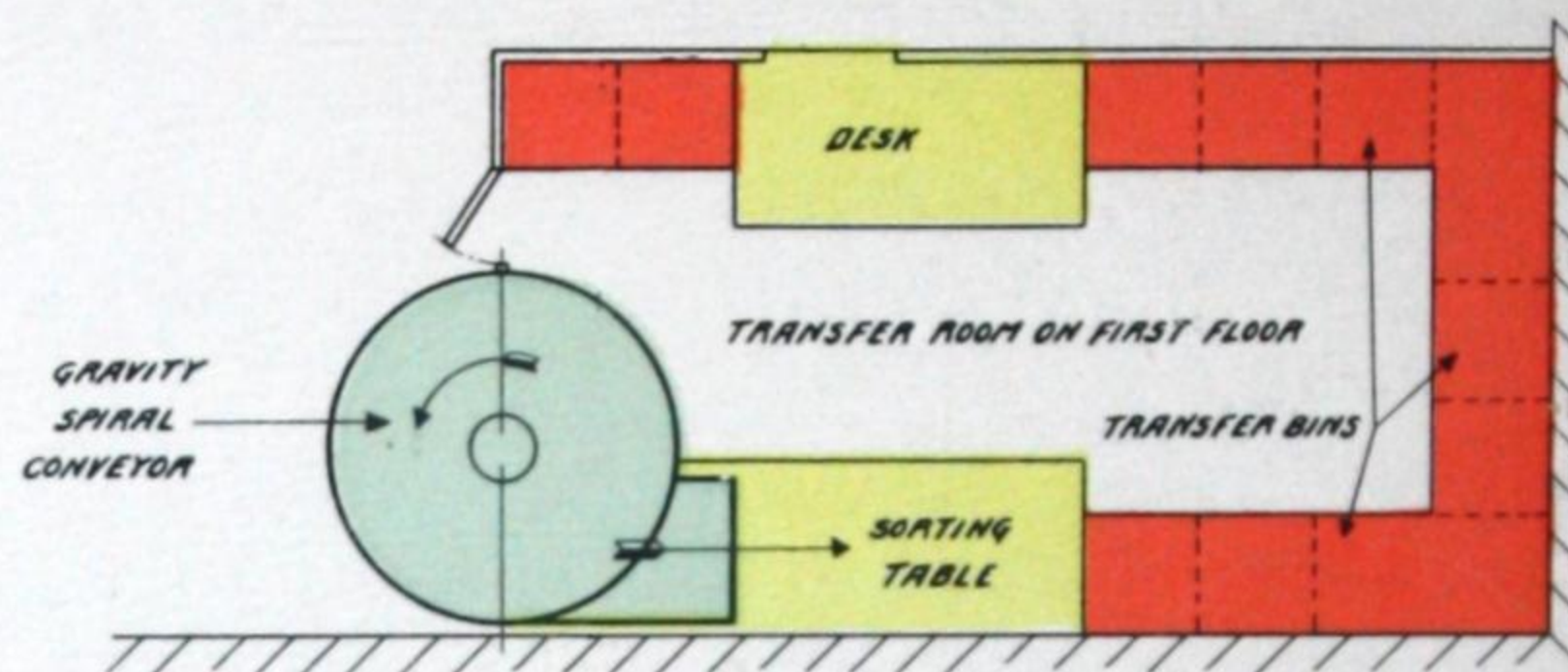
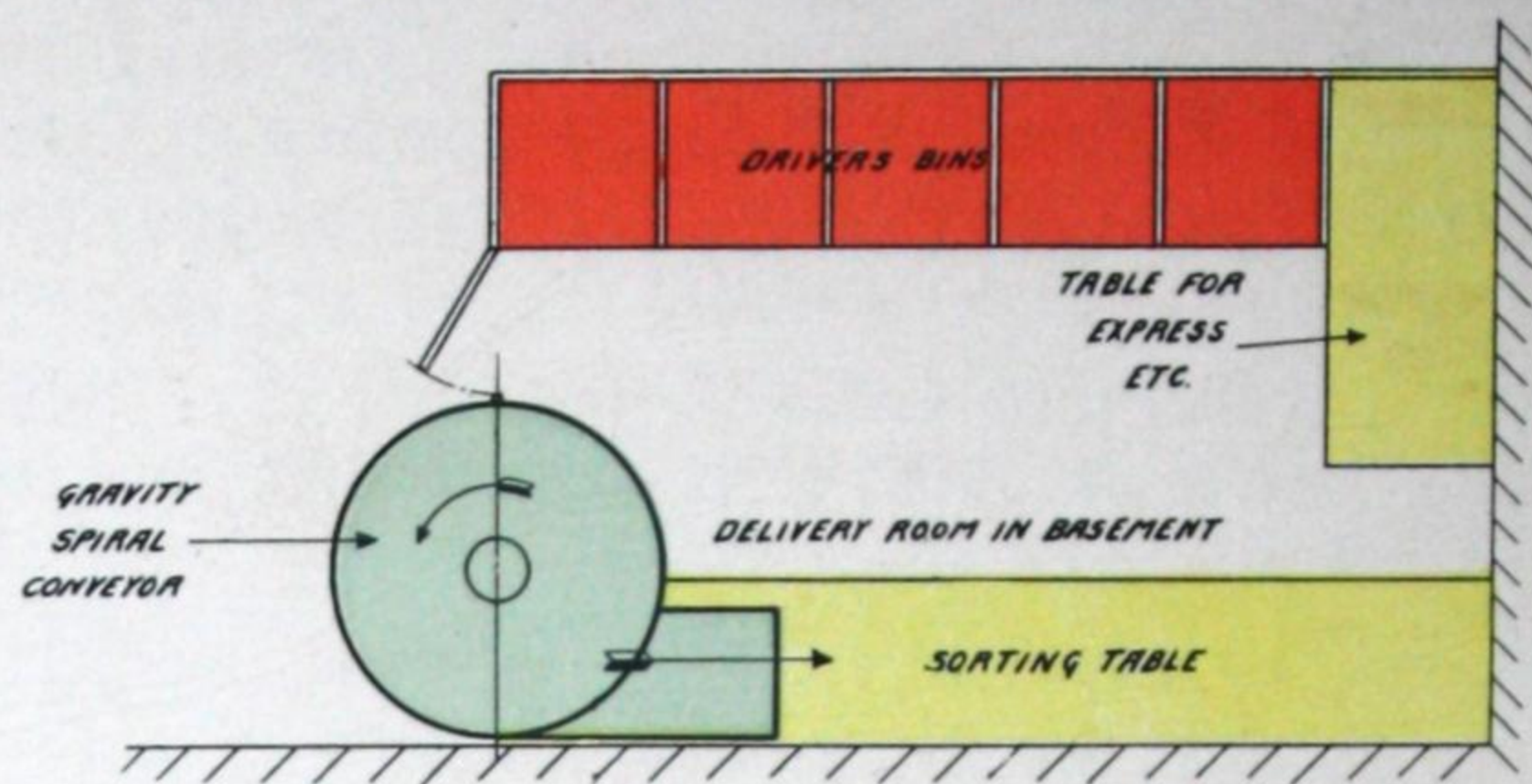
Transfer packages are placed on the other side of the divided belt, from which they are discharged into the transfer room.

After the "send" transfers are assembled and wrapped they are returned to the routers on the underside of the belt, whence they follow the same route as the "send" parcels.

The lower diagram on page 31 illustrates an arrangement for mail order houses, or houses that send most of their shipments by freight, parcel post or express.

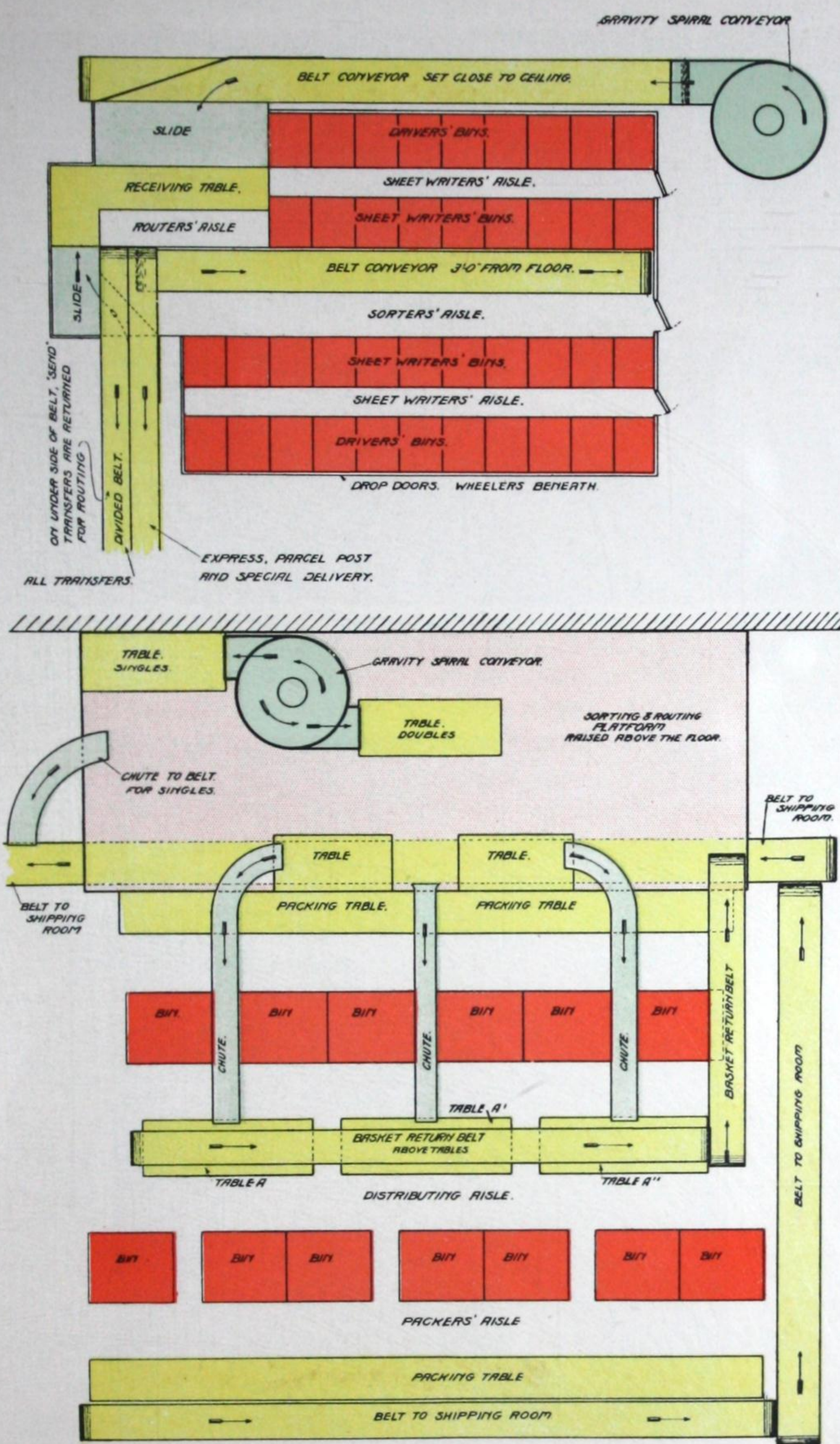
Orders are divided into "singles" and "doubles" according as they come from one department or from several different departments. The single department orders, which land on the table marked "singles," after being prepared for shipment, are sent down the chute directly to the belt leading to the shipping room.

Orders containing articles from various departments are sent down the Gravity Spiral Conveyor and land on the table marked "doubles." All articles belonging to one order are then gathered together in a basket and sent down one of the three chutes leading to the distributing tables, A, A', A". Here the articles are checked with the order and placed in the packers' bins. After being wrapped the packages are placed on the belt conveyor on which they are carried to the shipping room. The empty baskets are returned to the routing and sorting platforms by means of overhead belts or by a belt running under the tables with an inclined belt leading up to the raised platform.



TYPICAL DELIVERY ROOM PLANS

(Refer to Pages 28 and 29 for Explanation.)



TYPICAL DELIVERY ROOM PLANS

(Refer to Pages 28 and 29 for Explanation.)



Belt Conveyors receiving packages from outlets of Otis Spiral Conveyor
in Gimbel Brothers' New York Store



A Belt Conveyor delivering wrapped packages into Otis Gravity Spiral Conveyor
Pilgrim Laundry, Brooklyn, N. Y.

HORIZONTAL BELT CONVEYORS AS COMPLEMENTS TO GRAVITY SPIRAL CONVEYORS

THE capacity of the Gravity Spiral Conveyor is obviously enormous and is limited only by the speed at which the packages can be carried away from the outlets. A belt conveyor for transferring them horizontally has for this reason become the natural complement of the Gravity Spiral Conveyor in department stores and similar establishments where miscellaneous small packages are handled in large quantities. Belt conveyors also lend themselves admirably to the subsequent distribution of the goods.

Belt conveyors, as ordinarily constructed, consist of a horizontal belt running on rollers between two large pulleys, motor driven.

In large retail establishments, these moving belts are sometimes used to transfer merchandise from remote parts of the various sales floors to the Gravity Conveyor inlets. These belts can be run under the counters where they are concealed and at the same time are easily accessible. As soon as the packages are wrapped they are placed on the moving belt which carries them to the Gravity Conveyor which in turn carries them to the shipping room.

As described under "Typical Delivery Room Plans" a similar system is often used in the basement to carry the packages from the conveyor outlets to the drivers' bins.

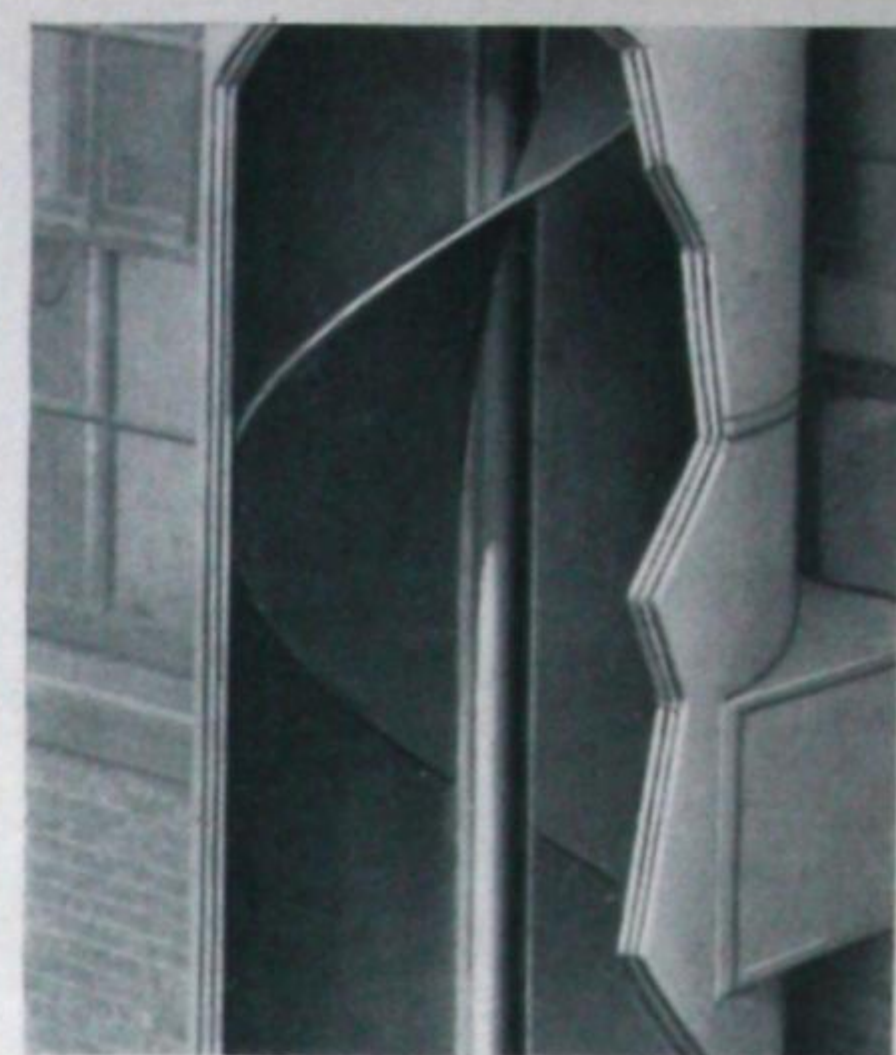
In factories, laundries and many other lines of business this system can be used with great success, excepting where heavy and bulky merchandise is handled.

There is no standard arrangement for the use of these belts, their arrangement depending in each case upon the conditions met and the work to be accomplished.

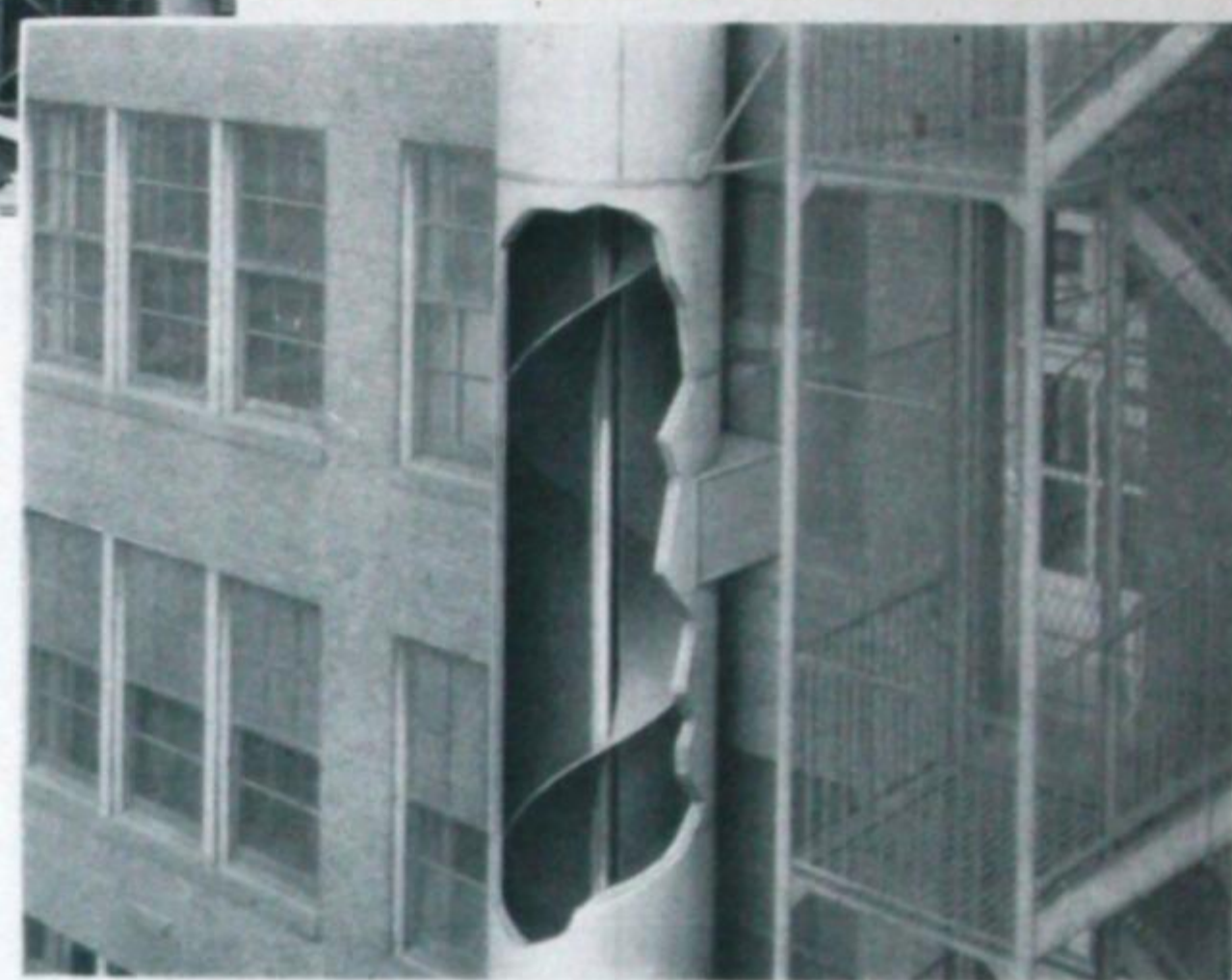
Belt conveyors are not furnished by the Otis Elevator Company but are mentioned here to assist the prospective user of Otis Gravity Spiral Conveyors in working out his merchandise handling system to the best advantage.



Conveyor Complete on
Outside of Building.



Showing Insulation Construction.



Sectional View of Conveyor.

SINGLE SPIRAL CLOSED TYPE CONVEYOR ON OUTSIDE OF BUILDING

OWING, in rare instances, to extremely limited space conditions inside of building, the Conveyor may be located against the outside building wall, the inlet throat-pieces extending through available windows or other openings. Exposed as it is to varying weather conditions, insulation is necessary to prevent condensation on the spiral blades. As clearly shown by the cut away section, this insulation consists of two one-inch air spaces, a centre lining of asbestos and an outer shell of light iron. We can recommend only the smaller diameter Conveyors handling light articles for this sort of installation.

TEN TYPICAL SYSTEMS

used in ten different lines
of business for lowering goods
on the

O T I S
GRAVITY SPIRAL
CONVEYOR

GRAVITY SPIRAL CONVEYORS IN A DEPARTMENT STORE

IN the Mandel Brothers store in Chicago, which is located in two connecting buildings, two Otis Gravity Spiral Conveyors, one in each building, are used for package handling. These conveyors are as follows:

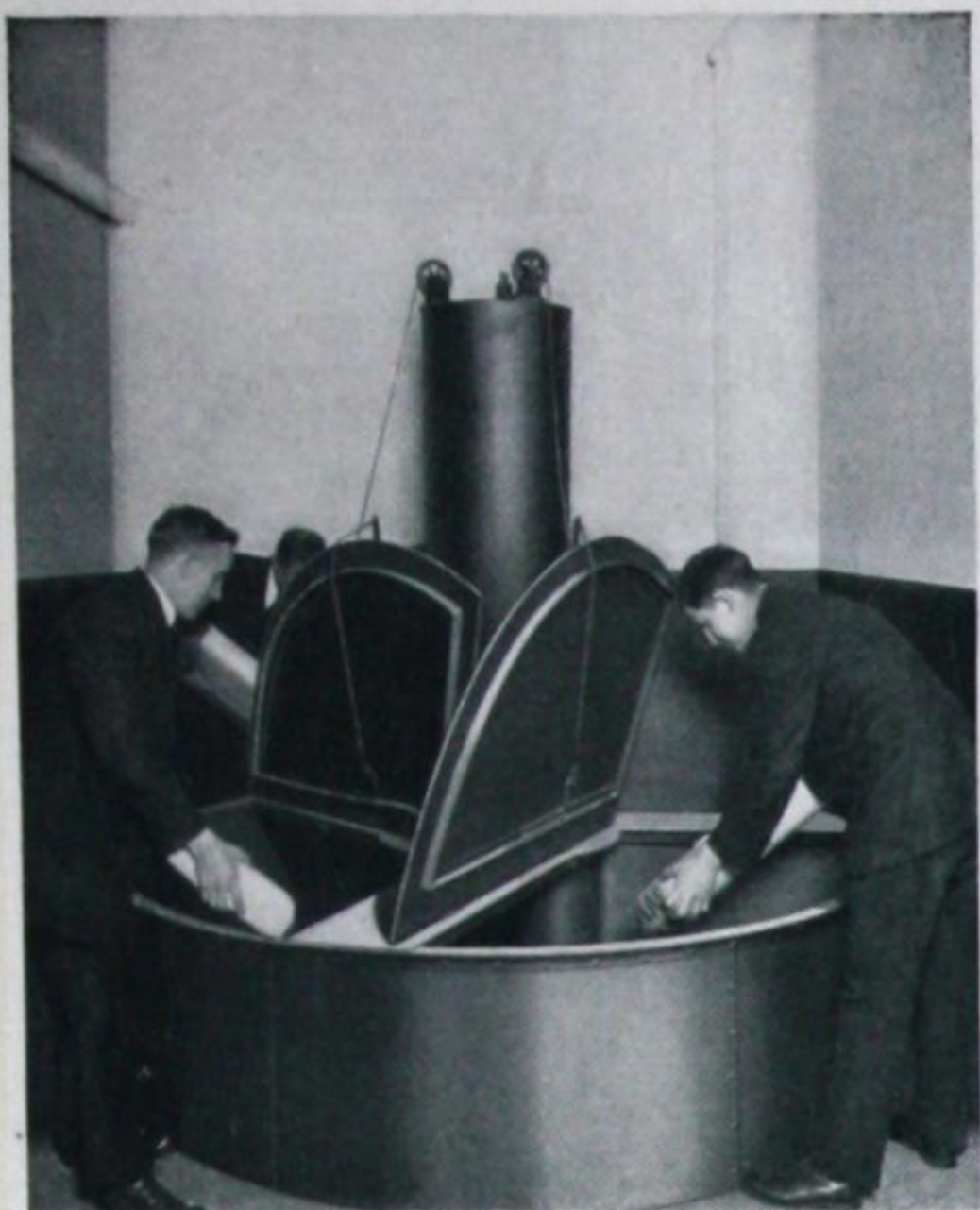
One triple spiral closed type Conveyor in the new building, all three of the spirals running from the 16th floor to belt conveyors below the sub-basement floor. Each spiral has an inlet at every floor.

One single spiral closed type Conveyor in the old building, running from the 11th floor to a belt conveyor at the sub-basement mezzanine, with an inlet at each floor.

The triple spiral Conveyor is used for two general purposes; first, for lowering merchandise from the stock rooms on the upper floors to the selling floors; second, for lowering sold merchandise from the selling floors to three belt conveyors below the sub-basement ceiling, which carry the packages to the distributing room, where they are sorted by delivery routes.

One spiral of this Conveyor is used to lower all merchandise from stock. At the basement, 1st, 2nd and 3rd floor inlets to this spiral, where the bulk of the stock orders originate, attendants are stationed, who can stop all goods coming down by means of hinged plates which close across the spiral blade and intercept the packages. These are either allowed to continue down the spiral or are taken off at their floor if so consigned. On the selling floors above the third, there are no attendants, the merchandise being lowered in groups and the floor signaled to remove it. This blade is also used to lower outgoing "express" and "parcel post" packages.

The other two blades in this Conveyor are used exclusively for outgoing packages from all floors, which are to be delivered by the store wagons or to be called for. One blade carries "cash" merchandise which comprises the largest part of the business, while the other carries "C. O. D.", "Will Call" and "Part Paid" packages. These packages are simply placed on the blades which discharge them upon the proper conveyor belts at the bottom and these in turn carry them to the distributing room where the packages are sorted by drivers' routes.



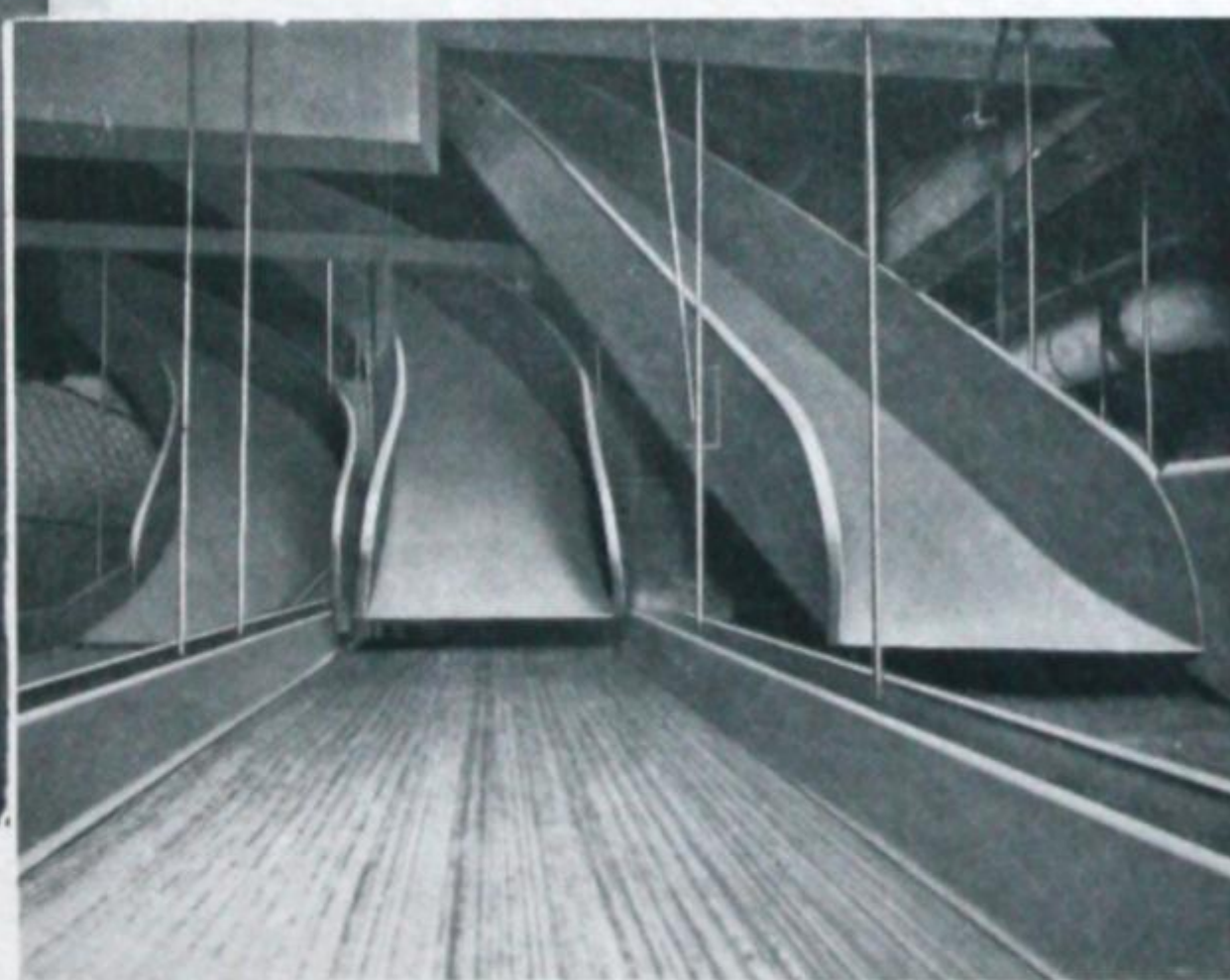
Top inlets of Triple Spiral Conveyor at Sixteenth floor.



Switchout Plate of Stock Spiral in raised position allowing free passage of packages and merchandise to lower floors.



Switchout Plate of Stock Spiral lowered to deflect packages from stock rooms at Sales floor.



Outlets of Triple Spiral Conveyor delivering upon traveling belts which lead to distributing room.

The single spiral Conveyor in the old building is used entirely for outgoing "Cash" purchases. These are delivered upon a belt conveyor which carries them to the belt conveying the "Cash" packages from the triple spiral Conveyor in the new building. Any "Express,"

"Parcel Post," "C. O. D.," "Will Call" or "Part Paid" packages from this building are trucked to the new building and lowered on the proper blades in the triple spiral Conveyor in order to land them on the belt conveyor at the bottom and thereby to concentrate all packages of the same classification in the same place.

GRAVITY SPIRAL CONVEYORS IN WHOLESALE AND MANUFACTURING CLOTHING HOUSE

The thirteen floors which this company occupies are used for the following purposes, the general course of material through the building being in a downward direction.

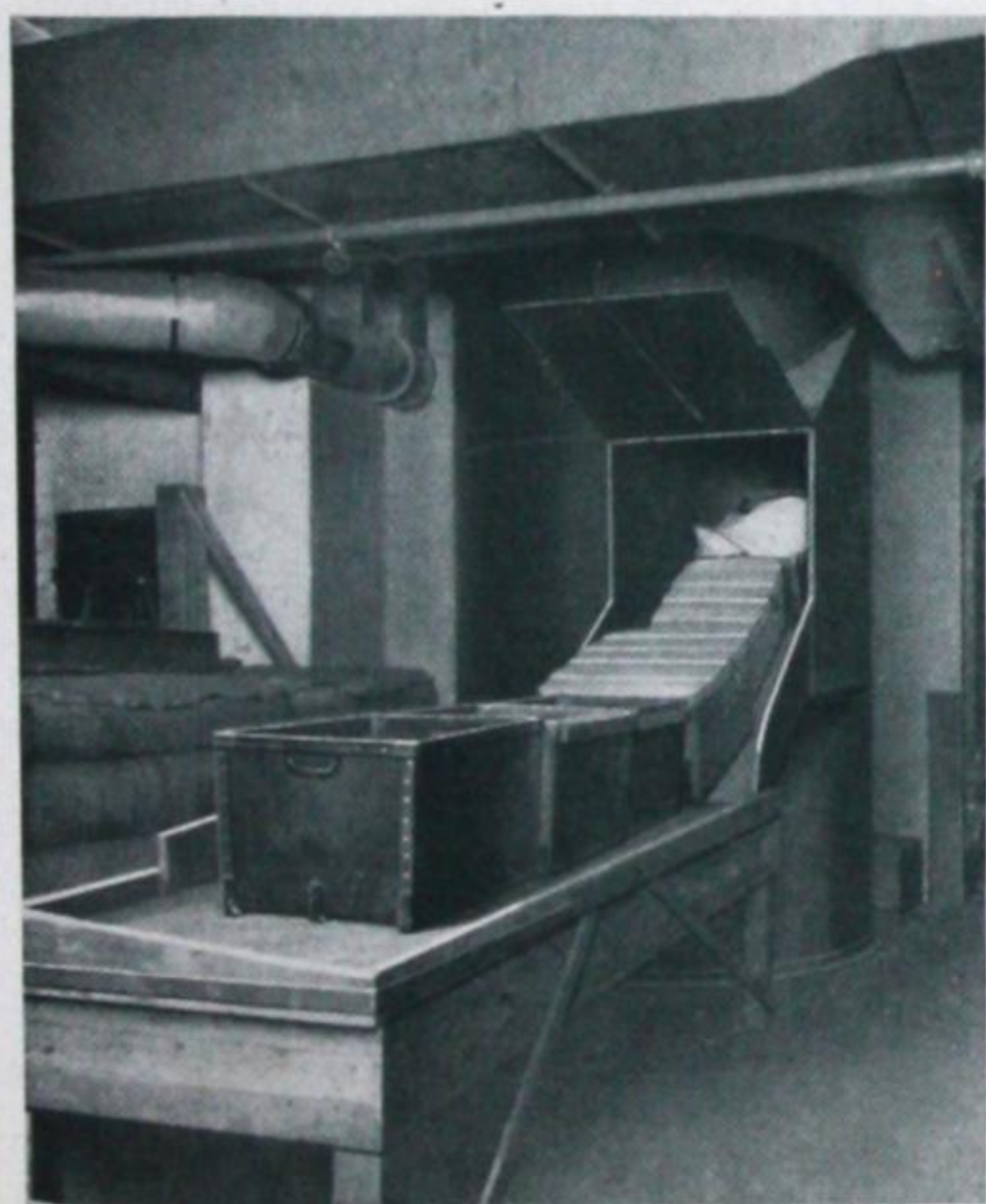
All of these floors are served by the Gravity Spiral Conveyor which runs from the thirteenth floor to the basement. The six spiral blades contained in the Conveyor are as follows:



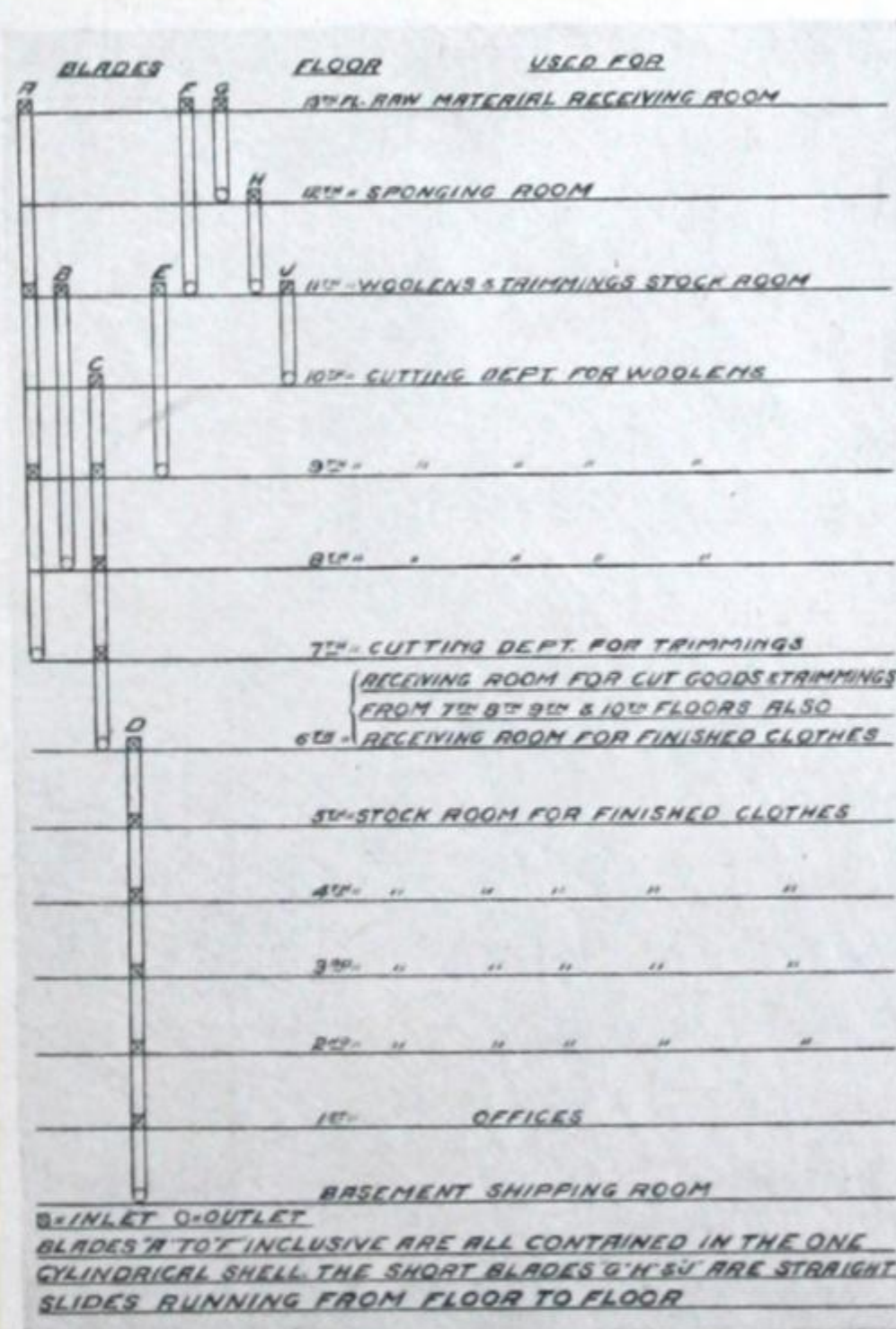
The two inlets of the Multi-Spiral Conveyor at 13th floor receiving room.



Outlet of Spiral "C" at 6th floor.



Outlet of Spiral "D" in Basement Shipping room.



- BLADE "A" runs from 13th to 7th floor with inlets at 13th, 11th and 9th and outlet at 7th floor.
- BLADE "B" runs from 11th to 8th floor with inlet at the 11th, and outlet at the 8th floor.
- BLADE "C" runs from 10th to 6th floor with inlets at 10th, 9th, 8th, and 7th and outlet at 6th floor.
- BLADE "D" Runs from 6th floor to basement with inlets at 6th, 5th, 4th, 3rd, 2nd and 1st and outlet at basement.
- BLADE "E" runs from 11th to 9th floors with inlet at 11th and outlet at 9th floor.
- BLADE "F" runs from 13th to 11th floor with inlet at 13th floor and outlet at 11th floor.

The Spiral Conveyor is supplemented by straight chutes running from floor to floor, which, together with the spiral, form a very comprehensive system for sending goods down through the building at a minimum handling cost.

The method of handling goods in this building is, in general, as follows: Raw material coming into the building is taken at once to the receiving room on the thirteenth floor from where the woolens, linings and trimmings are lowered on blade "F" to the stock room on the 11th floor with the exception of material to be sponged which is lowered by the independent chute "G" to the 12th floor and thence on chute "H" to the 11th floor.

From the stock room raw material is distributed to the cutting and trimming departments on the 10th floor by the independent chute "J" and to the 9th, 8th and 7th floors by blades "E", "B" and "A" respectively.

When cut and finished, the goods are sent to the 6th floor on blade "C" from where they are lowered in large consignments on the elevators, trucked to the work shops, made into finished suits, brought back to the building and taken up by elevators to the finished suit stock rooms on the 2nd, 3rd, 4th, 5th and 6th floors. Orders are filled from these stock rooms and are sent to the shipping room on blade "D" with the exception of very large consignments which are lowered on the elevators.

The spiral blades have a high polish which absolutely prevents damage to the goods from dust and dirt while in the conveyor.



One of the Conveyor inlets located at all floors.

outlet in the shipping room, is used as follows:

On entering the store, each customer is given an order blank which indicates the stocks carried on each floor. He then visits the various floors and personally selects his material. As the purchases are made on each floor they are placed in numbered baskets, or trays, which are lowered to the shipping room on the Gravity Conveyor immediately after the customer has finished on that floor.

When the final purchases have been made, the complete order blank with the tray numbers indicated thereon is placed in the last tray and sent to the shipping room, where the previous trays have been held. This indicates that the order is complete and it is then assembled, packed and shipped.

Mail orders are handled in a similar manner, except that the goods are not personally selected.

GRAVITY SPIRAL CONVEYORS IN A WHOLE-SALE DRYGOODS WAREHOUSE

IN the warehouse of the Ely-Walker Dry Goods Company in St. Louis, Mo., a single spiral closed type Conveyor, having inlets at all floors and an



Outlet of Conveyor in shipping room showing baskets used for conveyance of purchased goods.

GRAVITY SPIRAL CONVEYORS IN A FACTORY

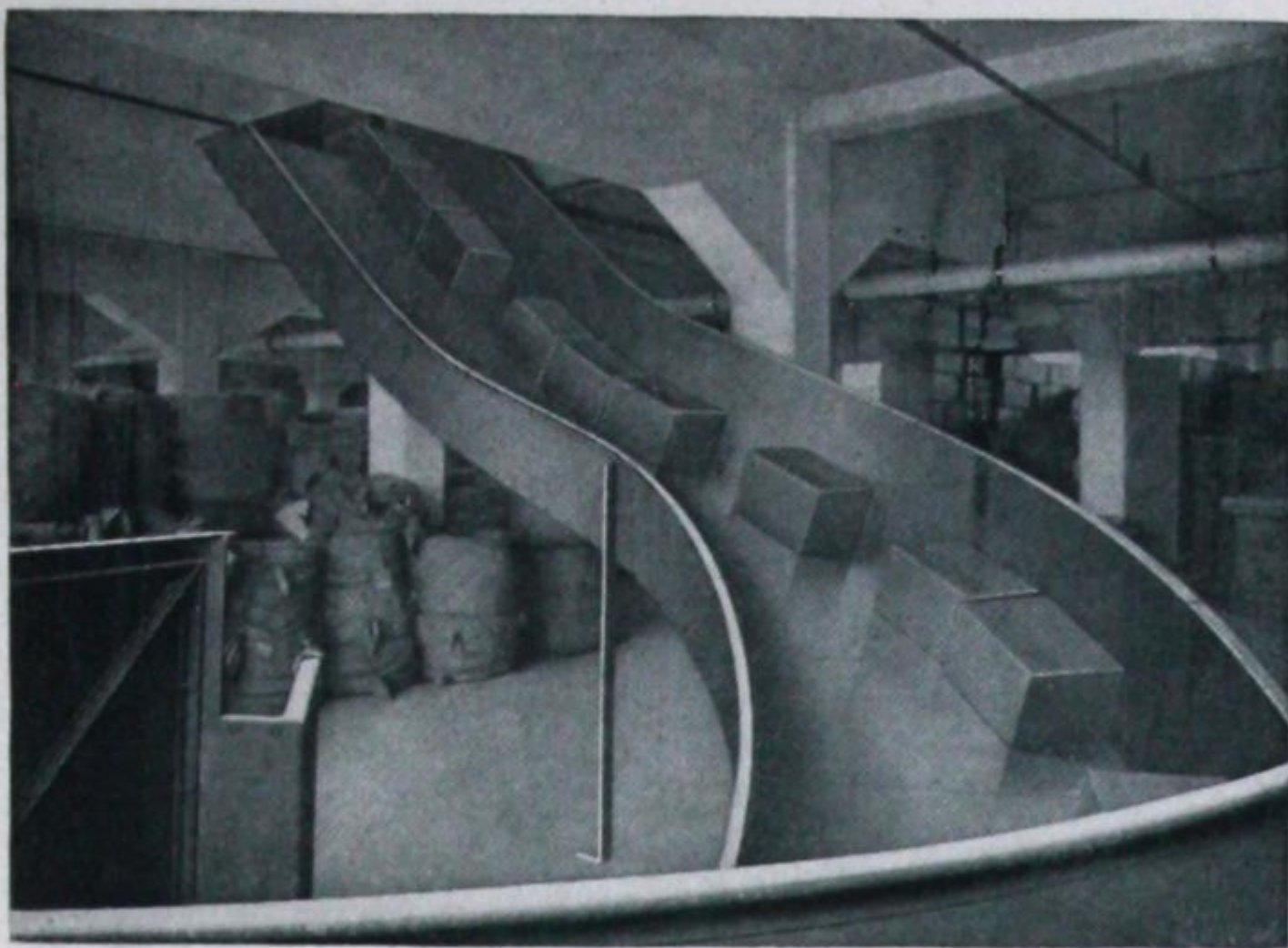
IN the stock and shipping building of the Boston Woven Hose and Rubber Company at Cambridge, Mass., a single spiral open type Conveyor is used for lowering crated boxes and burlap bundles, weighing from 60 to 600 pounds, from the 4th, 3rd and 2nd floors to the boxing and shipping departments on the first floor.

The building is a four story concrete structure, the three upper floors of which are occupied by the stock department. Shipping orders are received by the stock department from the order department, a duplicate order being sent to the shipper at the same time, to give him the opportunity of efficiently laying out the work of his department for the day. Under the prevailing system, orders for stock goods must be shipped the same day as received, so that the shipper, through the use of his duplicate copy of order, acts as an immediate check on all orders shipped, or to be shipped, thereby eliminating many of the delays which would naturally be encountered if no knowledge of shipments was at hand until the order had been returned to the billing department.

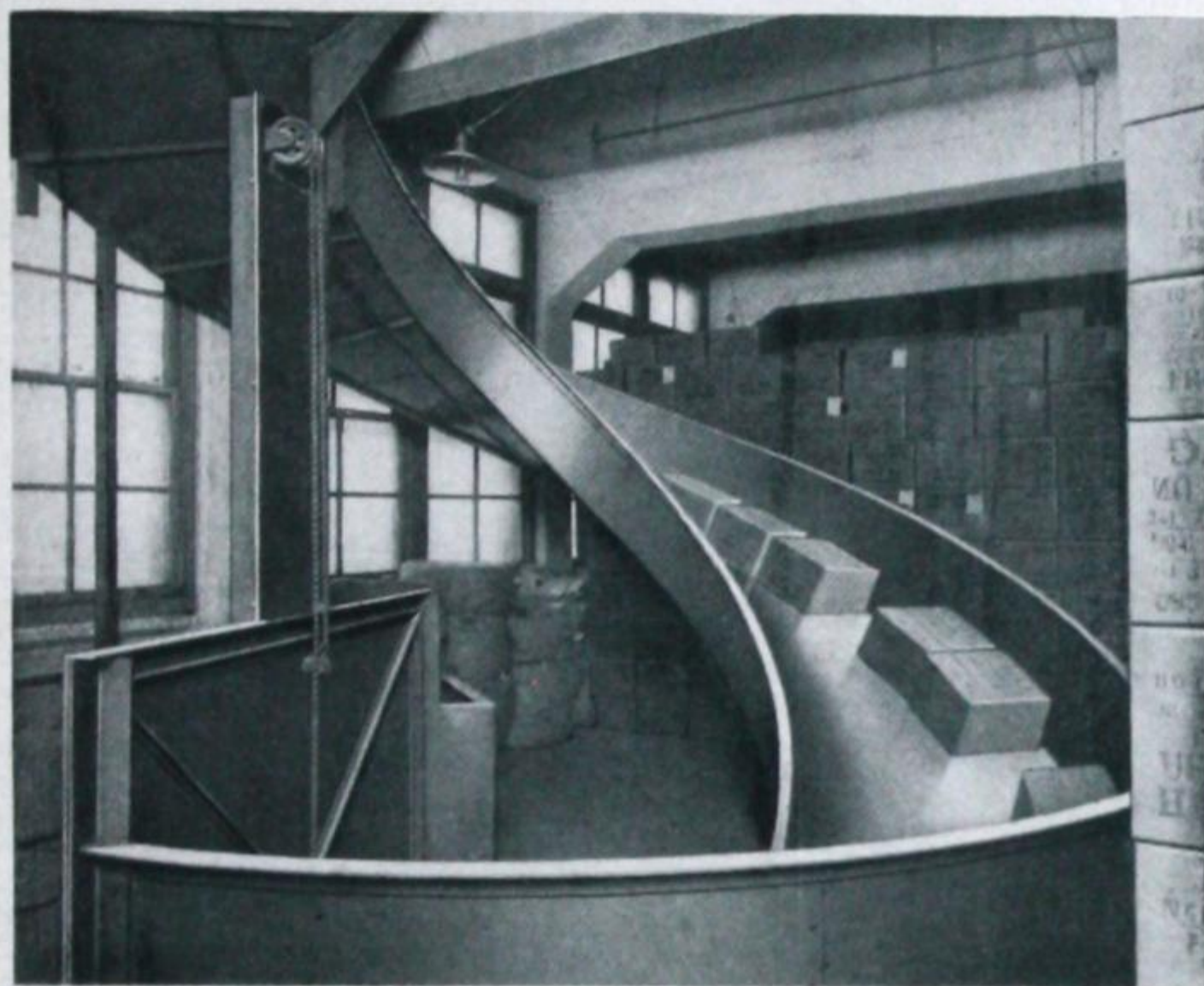
Goods are loaded into the Conveyor from any of the three upper floors, after having been marked with the order number upon which they apply. At the outlet of the Conveyor in the shipping department is a checker and under his direction, two truckers who distribute these goods to the baler or boxer who is to handle that end of the work.

While it might appear that considerable confusion would be caused by this system of sending from any one of the floors at the same time, such details are easily straightened out through a system of signal bells.

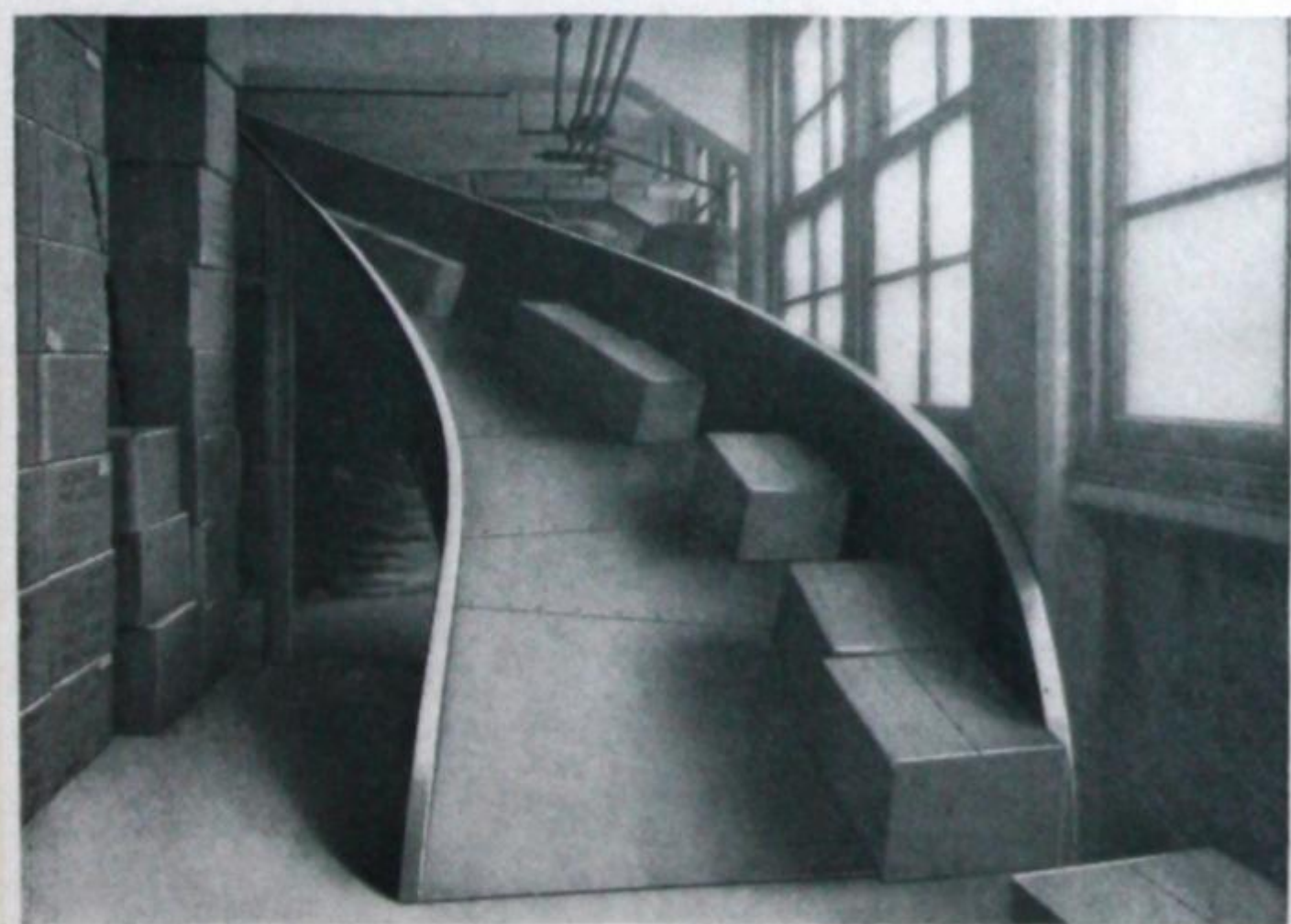
The Conveyor delivers the goods in a constant and uniform manner, handling the entire output of the factory which amounts to well over 25,000,000 pounds annually.



Third Floor.



Second Floor.



First Floor.

Single Spiral Open Type Conveyor in Boston Woven Hose and Rubber Company.

GRAVITY SPIRAL CONVEYORS IN A LAUNDRY

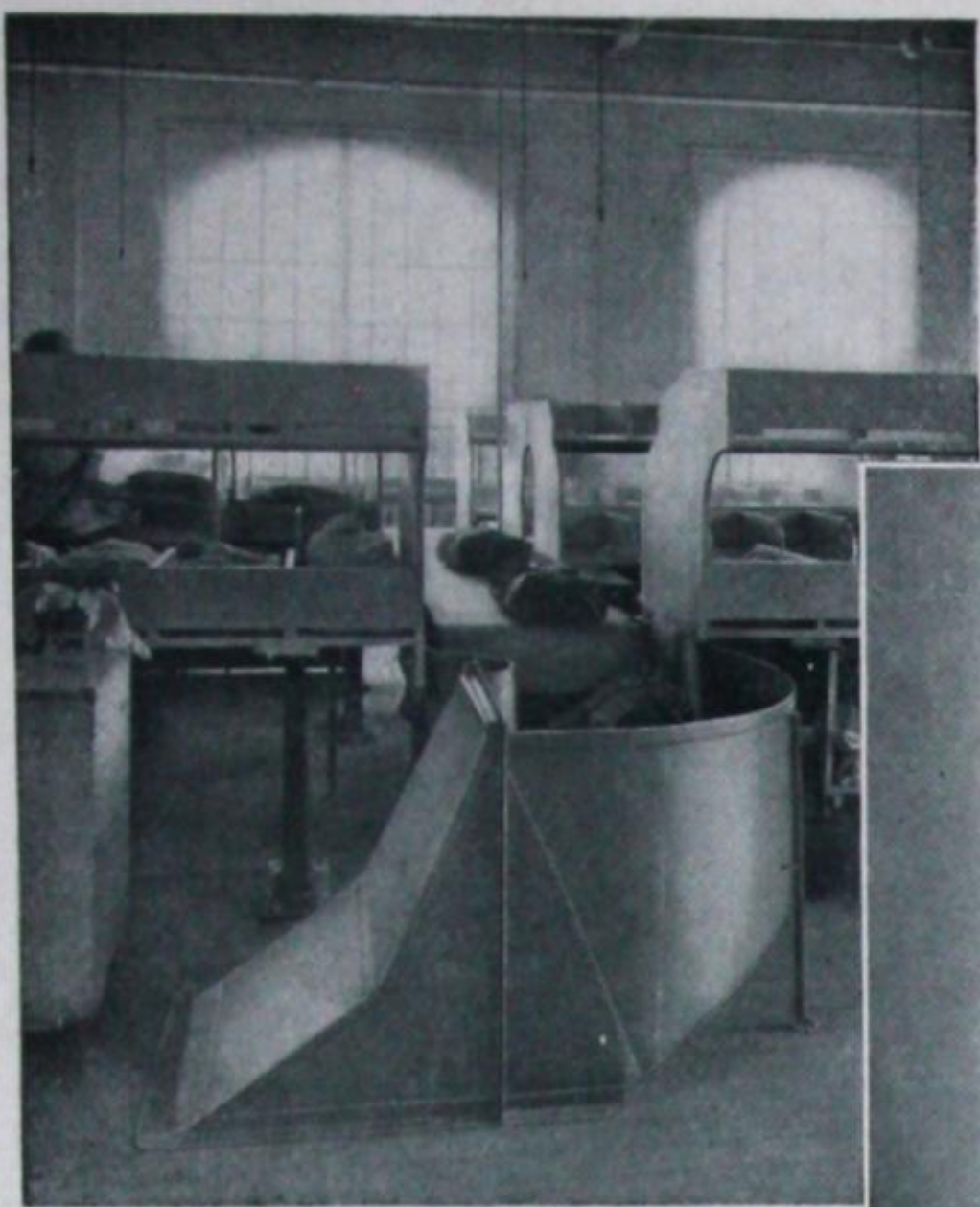
THE Pilgrim Laundry of Brooklyn, N. Y., one of the most modern laundries in the country, is using Gravity Spiral Conveyors to convey bundles from its different departments to the delivery room. The laundry is housed in a three story structure and the Conveyor equipment is as follows:

1. One two-spiral closed type Conveyor extending from the third to the first floor, one spiral of which is used exclusively for flat work and the other for collars, with an inlet for the former at the third floor and for the latter at the second floor.
2. One single spiral open type Conveyor extending from the second to the first floor and used for shirts only, with inlet at the second floor.
3. One single spiral open type Conveyor extending from the first floor to the loading platform, with inlet at the first floor.

In this laundry the collections of shirts and collars are taken up to the second floor, and all flat work to the third floor. On both of these floors the clothes are started at one end of the building and are moved through the regular processes of marking, washing, extracting, etc., the finished laundry arriving at the other end where it is sorted and wrapped for delivery, the shirts, collars and flat work each being wrapped separately.

On the third floor, the finished laundry is sorted and brought by trucks to tables where it is wrapped into packages. These packages are then deposited upon a belt conveyor (figure 1) which carries them along and drops them into the Gravity Conveyor which in turn delivers them upon a table in the shipping room as illustrated in figure 3. Here they are sorted by delivery routes and placed in the proper delivery bins.

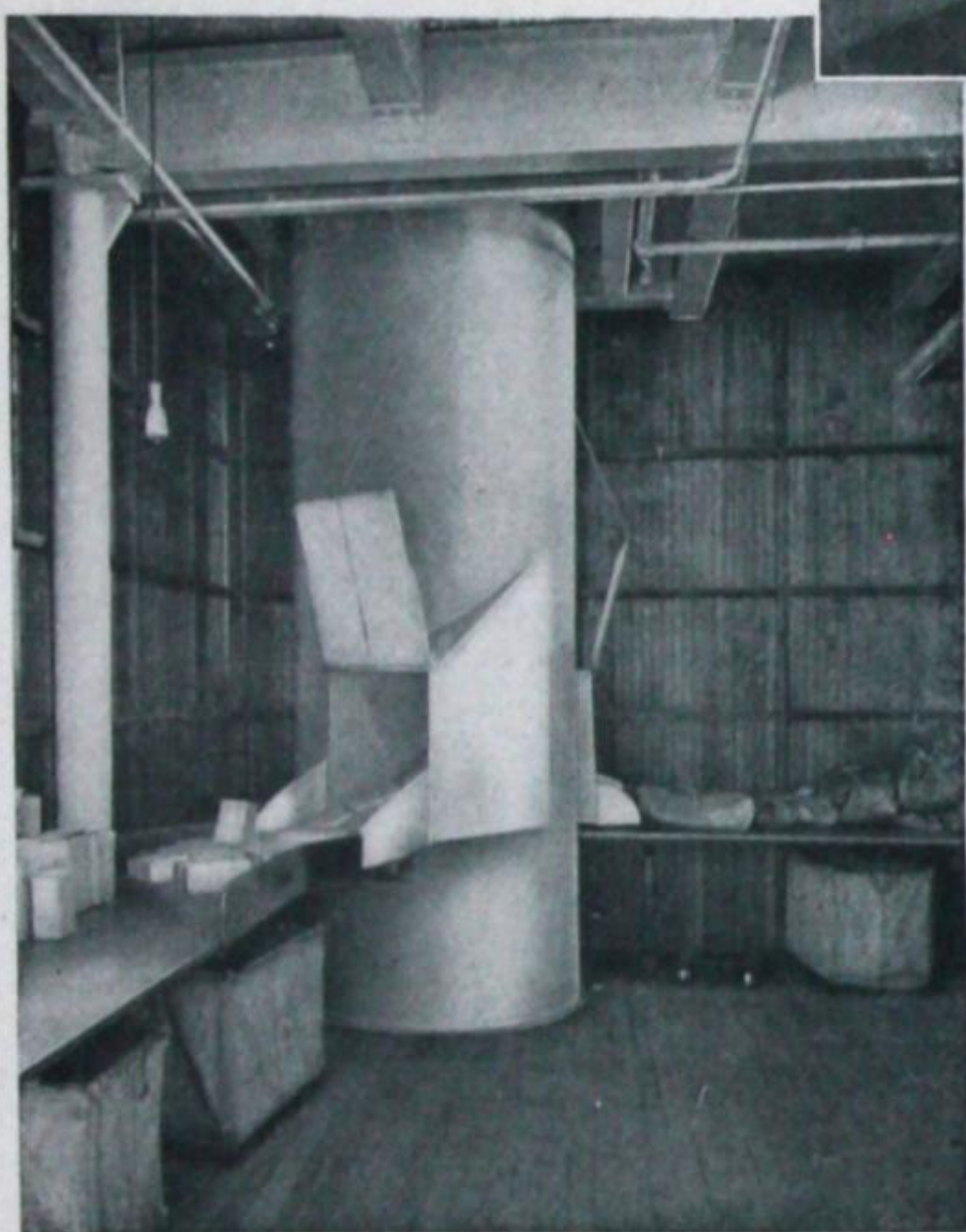
On the second floor, the shirts and collars are handled in the same way, except that the packages are placed directly into the Conveyor without the use of a belt.



Third floor inlet. (figure 1.)



Second floor inlet.
(figure 2.)



Outlets in Shipping room showing
separation of collar packages from
flat work. (Figure 3.)

Figure 2 shows the collars being placed in the Conveyor and figure 3 the packages being discharged upon the table in the shipping room.

When the deliveries are made up the packages are placed in baskets, which are carried to the loading platform on the single spiral open type Conveyor.

GRAVITY SPIRAL CONVEYORS IN A WHOLESALE MERCHANDISE WAREHOUSE

BUTLER Brothers of St. Louis are using two single spiral closed type Conveyors and one open type. One of the closed type Conveyors is used exclusively for express, mail and city delivery orders. On receipt of an order a requisition is made out for each floor covering the items carried in stock on that floor. These orders are then filled and packed on the various floors and placed in the Conveyor which lowers the packages to the delivery floor, where they are assembled and checked with the original order, and whence they are delivered to the Express Companies, the Post-Office or their destination.

The other closed type Conveyor is used for lowering freight shipments in the following manner:

Floor orders are filled on the various stock floors, in the same manner as the express shipments, and are placed in numbered trays, or baskets, together with the order slip; these trays or baskets are then placed in the Conveyor which discharges at the packing room on the fourth floor. When the trays are received on the fourth floor they are placed in numbered racks until the entire order is complete. This is determined by checking the various floor orders with the customer's complete order. The trays are then assembled and the complete order is packed, after which it is placed in the large open type Conveyor and sent to the shipping floor.

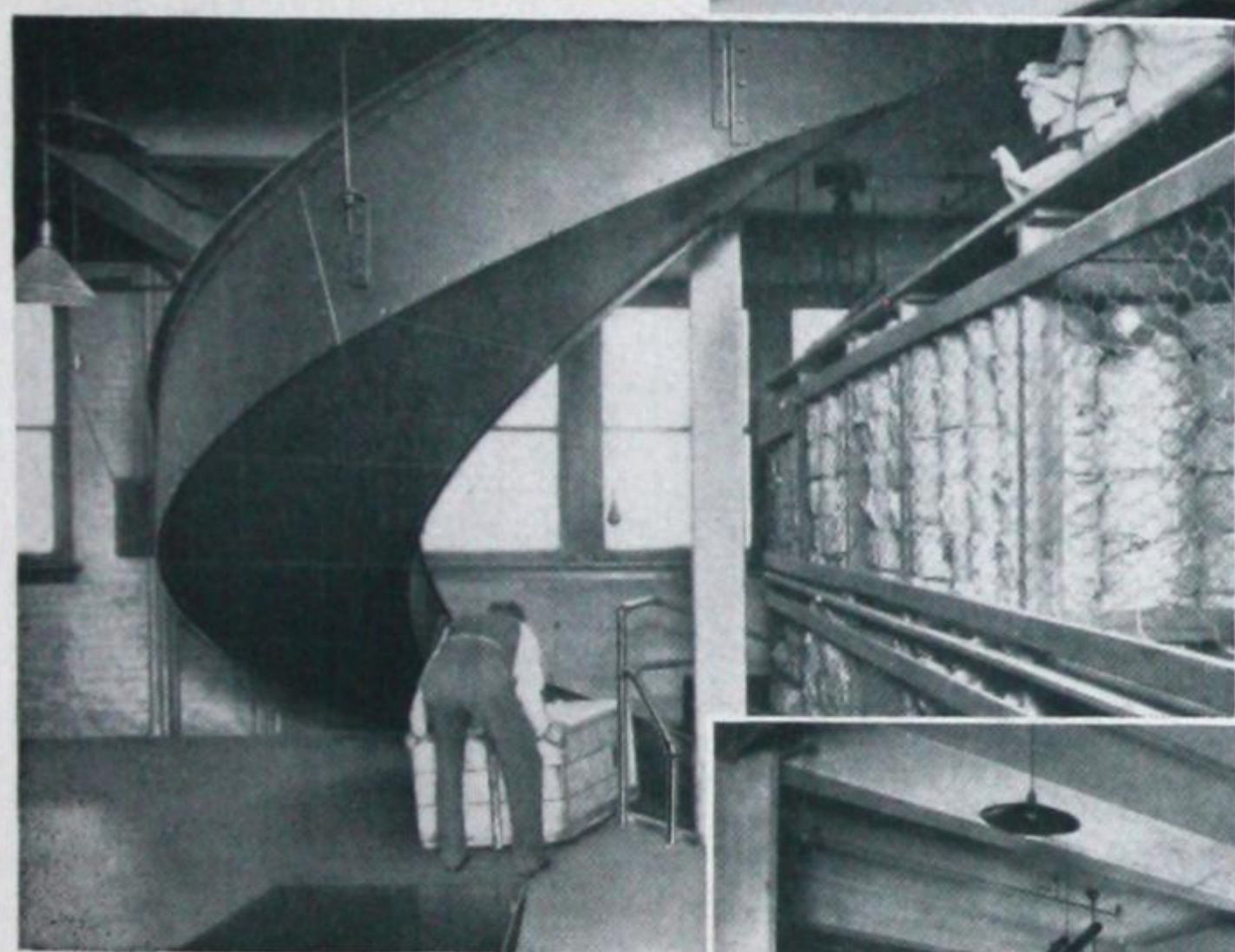
The open conveyor has inlets at all floors and is used also for handling goods to be shipped in original packages. These packages, together with the packed orders from the fourth floor, are then assembled on the shipping floor for shipment.



Inlet to Closed type Con-
veyor at one of the
Stock floors



Numbered baskets from
Stock floors being received
in packing room on
4th floor.



Sending cased goods on
large Open type
Conveyor.



Outlet of large open type Conveyor in
Shipping room.

GRAVITY SPIRAL CONVEYORS IN A WHOLESALE DRUG HOUSE

IN the wholesale drug business, as in many other wholesale lines, the individual consignments consist largely of various quantities of miscellaneous items. As the stock is usually distributed over more than one floor, in filling the orders these items must be assembled at one point to be boxed for shipment. This, as well as sending the boxed consignments to the shipping room, is accomplished in the plant of Morrisson, Plummer & Co., wholesale druggists of Chicago, by means of two Otis single spiral closed type Conveyors.

One Conveyor which runs from the 6th to the 2nd floor with inlets at all stock floors and outlet at the 2nd is used to lower all small packages to the second floor to be boxed.

On the 2nd floor distributing tables are provided near the Conveyor outlet, each table being used for certain customers, where all the small packages for each customer are assembled.

In the stock rooms the packages are loaded into wicker baskets (with the exception of the larger packages which require no basket) each package being marked to designate the distributing table to which it is to be delivered. The baskets are then placed on the Conveyor which lowers them to the 2nd floor where the packages are assorted and sent to the proper tables.

When a complete consignment is made up it is placed in a box truck and pushed to the packing room, boxed and lowered on the second Conveyor which extends from the 2nd floor to the shipping room.



Outlet of Single Spiral Closed Type Conveyor discharging order baskets in assorting and packing room on second floor.

GRAVITY SPIRAL CONVEYORS IN A WHOLESALE SHOE WAREHOUSE

A single spiral open type Conveyor, with inlets at all floors and outlet in the shipping room, is used in the warehouse of Roberts, Johnson and Rand Company, shoe wholesalers of St. Louis, Mo. in the following manner:

An order is received and is routed to the various stock floors to be filled. The order usually calls for goods in original boxes and broken lots. As the order is filled on each floor the broken lots are placed in crates and held in numbered



Original Boxes at inlet to Conveyor. Note fire door and speaking tube at right.

bins on that floor, the bin number being marked on the order. The original boxes belonging to this order are placed near the inlet to the Conveyor. These original boxes are given the same number as the bin in which the broken lots are placed.

When the complete order is filled it is returned to the order clerk who makes out a ticket for the shipping clerk indicating the bin number on each floor where material called for on the order is held, the order clerk



Boxes and Crates arriving in Shipping Room. A shipping clerk gives instructions to Stock Clerks on floors above through speaking tube.

retaining the original order for billing purposes. When the shipping clerk receives the ticket made out by the order clerk he communicates by means of a speaking tube with the stock clerk on each floor who places the crates together with the original boxes in the Gravity Conveyor which delivers the entire order to the shipping room. This system automatically concentrates the entire order and as the orders are sent through consecutively, simplifies the work of the shipping department and facilitates the shipment of the goods.

GRAVITY SPIRAL CONVEYORS IN A MAIL ORDER HOUSE

THE Standard Mail Order Company of New York City has two large triple spiral closed type Conveyors which are the central points of the entire stock distributing and delivery systems. Each Conveyor extends from the shipping room in the basement to the 8th floor with inlets to all three spirals at each floor. The 5th, 6th, 7th and 8th floors are stock floors from which goods of all kinds are sent by two of the spirals of each Conveyor to the 4th floor which is known as the "order-filling" floor. Here switchout plates at the inlets throw the canvas bags in which the stock merchandise is placed upon tables from which the goods are removed by trucks to their proper bins or tables. The third spiral is used to convey "single orders" direct from the stock floors to the packing room in the basement.

As assorted orders are received, goods are collected and placed in canvas bags and brought by means of an overhead system to the Conveyors, where the bags are automatically released and dropped into a large receiving rack. From here all orders which do not include coats or cloaks are delivered directly to the basement packing room on the "single order" spiral where they are packed for shipment. Orders which call for coats or cloaks to complete the assignment are sent to the third floor, a switchout plate breaking their journey at this point. At this floor the coat or cloak is added and the entire order is packed and sent down one of the spirals to the shipping room.



Inlets to Conveyors at 5th floor—a stock floor.



The 4th or "Order-filling" floor, showing how orders are brought to Conveyor in canvas bags by an overhead carrier.



Bags deflected at 3rd floor by switchout plate.



Shipping room in basement, showing three outlets.

GRAVITY SPIRAL CONVEYORS IN A WHOLESALE GROCERY WAREHOUSE

AT the nine story wholesale grocery warehouse of the Steele-Wedeles Company in Chicago incoming goods are received in car lots via the Illinois Tunnel Company whose tracks run under the building. The cars are run onto a freight elevator at one end of the building, lifted to the proper floor, pushed off, unloaded, run to the other end of the building and lowered again to the tracks.

To expedite the movement of goods from the stock floors to the shipping room an Otis triple spiral closed type Conveyor, having inlets to all spirals at each floor is used. Two of these spirals are used for city orders requiring no additional packing, one for city delivery orders and one for city waiting orders. The third spiral which delivers to the next level above the other two is used for shipments going outside of Chicago which must be properly packed for express or freight.



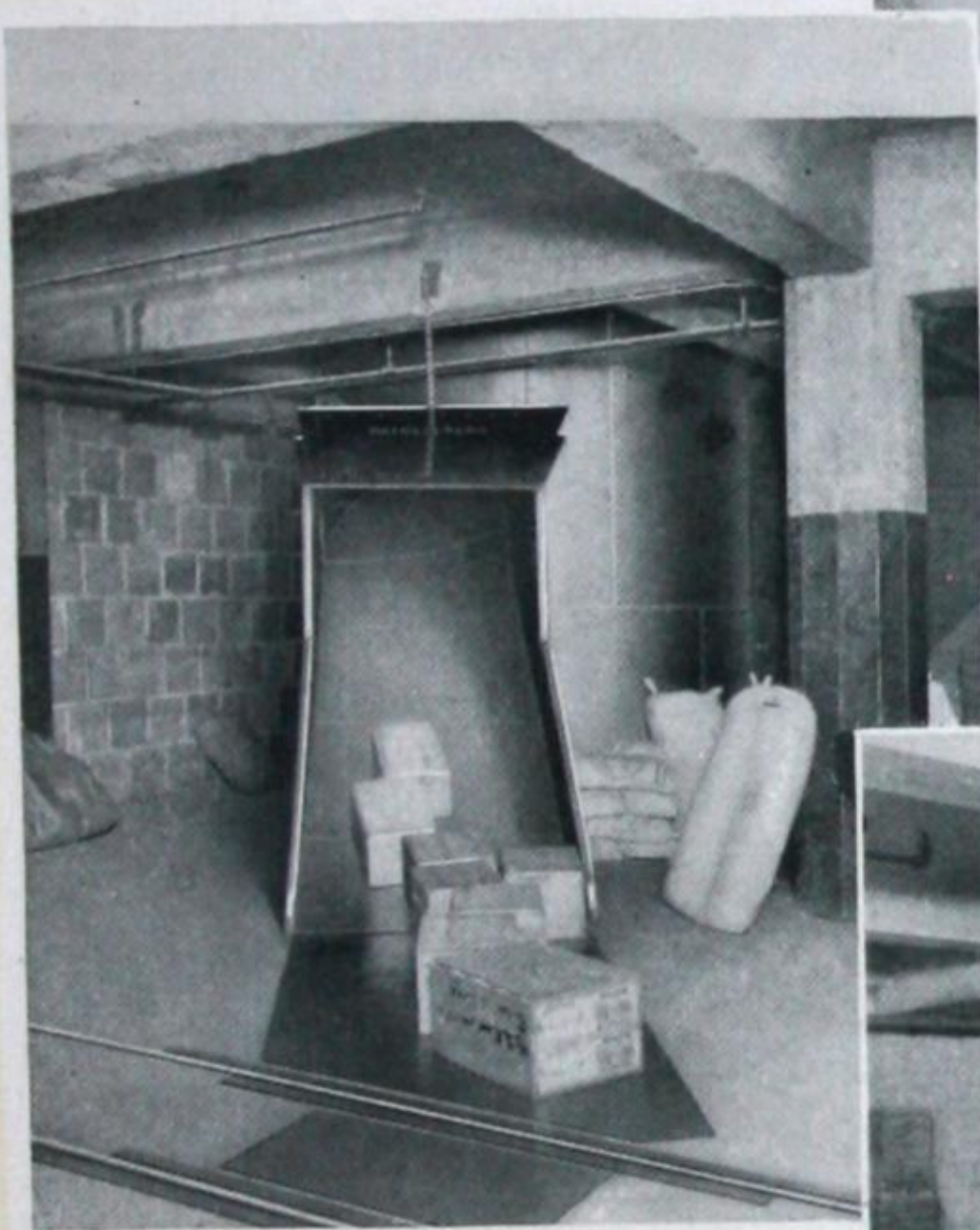
Tunnel Car being loaded at Shipping room floor



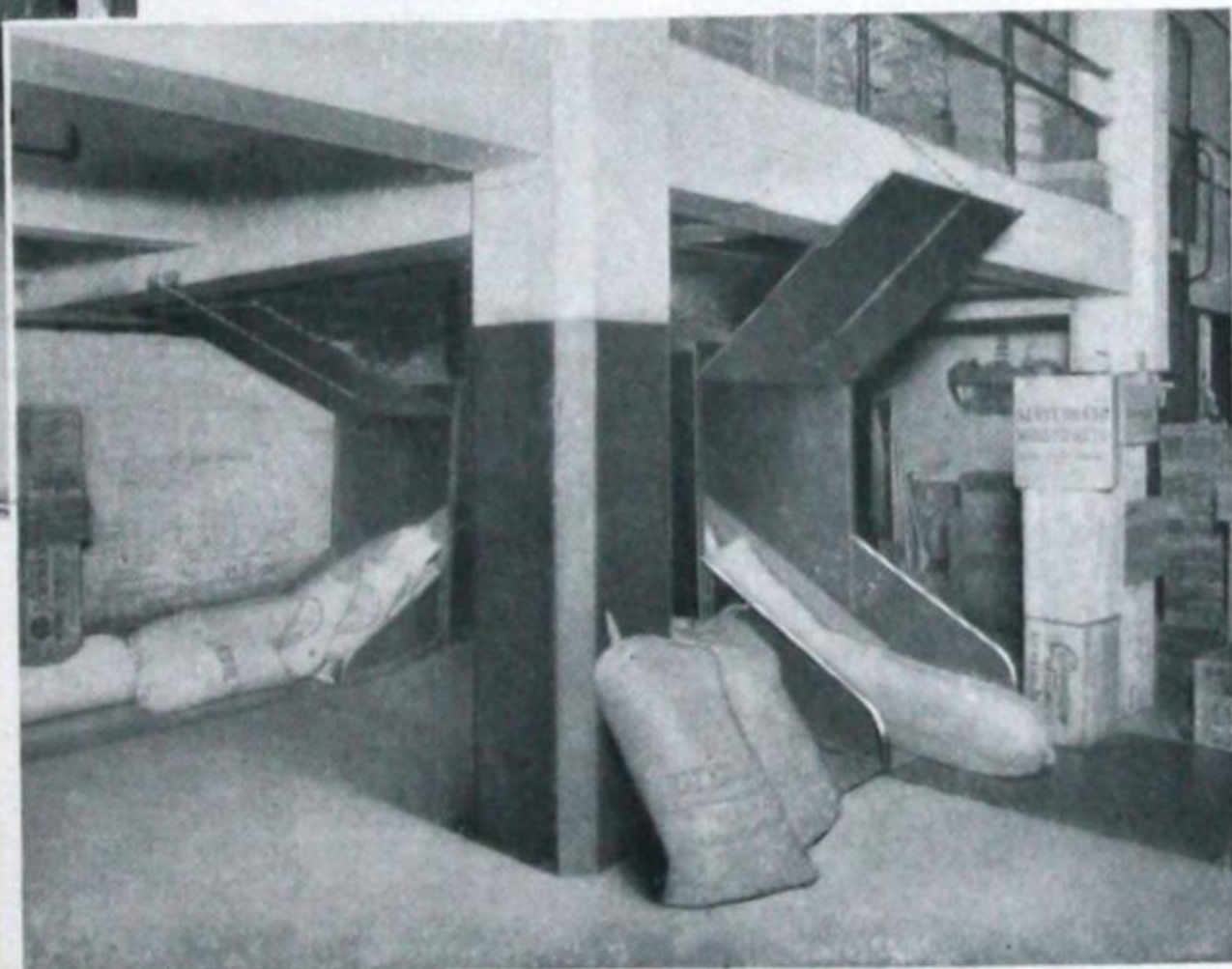
Top inlet of Triple Spiral Conveyor.



Inlets on 5th floor.



One of the Spirals discharges into packing room on 2nd floor.



Two of the Spirals are used for city deliveries. Outlets at Shipping platform.

PARTIAL CLASSIFIED LIST OF OTIS GRAVITY SPIRAL CONVEYOR INSTALLATIONS.

DEPARTMENT AND RETAIL STORE

Name of Owner	Location
John G. Myers.....	Albany, N. Y.
Davison, Paxson & Stokes....	Atlanta, Ga.
Hecht & Co.....	Baltimore, Md.
Hochschild, Kohn & Co.....	" "
Hutzler Bros.	" "
Houghton & Dutton.....	Boston, Mass.
W. A. Bacon Co.....	" "
Sheperd Norwell Co.	" "
R. H. Stearns & Co.....	" "
Jordan, Marsh & Co.....	" "
Wm. Filene & Sons.....	" "
Gilchrist & Co.	" "
Howland Dry Goods Co.....	Bridgeport, Conn.
A. D. Matthews Son.....	Brooklyn, N. Y.
Wm. Hengerer & Co.....	Buffalo, N. Y.
Killain Co.	Cedar Rapids, Ia.
Marshall Field & Co.....	Chicago, Ill.
Mandel Brothers	" "
The Fair	" "
Rothchild & Co.	" "
Chas. A. Stevens & Co.....	" "
Siegel Cooper Co.	" "
L. Klein	" "
The Hub Store	" "
The John Shillito Co.	Cincinnati, O.
Halle Brothers	Cleveland, O.
May Company	" "
F. & R. Lazarus & Co.....	Columbus, O.
The Harris Store.....	Dallas, Tex.
Titche-Goettinger Co.	" "
Sanger Bros.	" "
Harned & Von Maur, Inc....	Davenport, Ia.
V. E. Carson.....	Dawson City, N. M.
Denver Dry Goods Co.....	Denver, Colo.
Yunker Brothers	Des Moines, Ia.
Crowley-Milner Bldg.	Detroit, Mich.
J. L. Hudson Co.	" "
W. H. Elliot	" "
Newcomb Endicott & Co....	" "
Goldberg Brothers	" "
Everybody's Dept. Store....	El Paso, Tex.
Meachan Dry Goods Co....	Ft. Worth, Tex.
Garbade-Eiband & Co.....	Galveston, Tex.
Charles H. Eyerly.....	Hagerstown, Md.
Stanley Mills Co.....	Hamilton, Ont.
Wise, Smith & Co.....	Hartford, Conn.
W. C. Munn Company.....	Houston, Tex.
Levy Bros. Dry Goods Co.	" "
Rorabaugh Wiley Co.....	Hutchinson, Kan.
Pettis Dry Goods Co.....	Indianapolis, Ind.
Wm. H. Block.....	" "
Cohen Brothers	Jacksonville, Fla.
John Taylor Dry Goods Co.,	Kansas City, Mo.
Emery, Bird, Thayer & Co.	" "
Selfridge Stores	London, Eng.
Hamburger Realty & Trust	" "
Co.	Los Angeles, Cal.
Broadway Dept. Store....	" "
Herzfeld-Phillipson Co. ...	Milwaukee, Wis.
Powers Mercantile Co....	Minneapolis, Minn.
L. Bamberger & Co.....	Newark, N. J.
New Bedford Dry Goods	" "
Co.	New Bedford, Mass.
D. H. Holmes & Co.....	New Orleans, La.
B. Altman & Co.....	New York, N. Y.
Jas. McCreery & Co.....	" "

Name of Owner Location

Rogers, Peet & Co.....	New York, N. Y.
H. C. F. Koch & Co..	" "
Bonwit, Teller & Co.....	" "
Rothenberg Co.	" "
Best & Company.....	" "
Oppenheim Collins & Co.	" "
Simpson-Crawford Co. ...	" "
Gimbel Brothers	" "
Saks & Co.....	" "
J. B. Greenhut & Co....	" "
John Wanamaker	" "
Lord & Taylor.....	" "
Francis Rogers & Sons...	" "
Stern Brothers	" "
Miller, Rhoades & Swartz....	Norfolk, Va.
Kahn Realty Co.	Oakland, Cal.
Strawbridge & Clothier....	Philadelphia, Pa.
John Wanamaker	" "
Gimbel Brothers	" "
Rosenbaum Company.....	Pittsburgh, Pa.
Jas. McCreery & Co.....	" "
Kaufman Dept. Stores, Inc..	" "
Kaufman Baer Company...	" "
Boggs & Buhl.....	" "
Olds, Wortman & King.....	Portland, Ore.
Lipman, Wolf & Co.....	" "
Meier & Frank.....	" "
E. W. Edwards & Son....	Rochester, N. Y.
Youngs & McCombs.....	Rock Island, Ill.
Wheeler & Motter Dry	" "
Goods Co.	St. Joseph, Mo.
Grand Leader Store.....	St. Louis, Mo.
Scruggs, Vandevort & Bar-	" "
ney	" "
Famous and Barr Co.....	" "
Emporium Dry Goods Store..	St. Paul, Minn.
Wolf & Marx Company...	San Antonio, Tex.
Newman & Lewinson...	San Francisco, Cal.
The Emporium	" "
Roos Brothers	" "
Magnin & Co.....	" "
Frederick & Nelson.....	Seattle, Wash.
Bon Marche Store.....	" "
Dey Brothers & Co.....	Syracuse, N. Y.
Thompson-Hudson Co.	Toledo, Ohio
W. M. Crosby Dry Goods Co.	Topeka, Kan.
Robert Simpson Company...	Toronto, Can.
John A. Roberts.....	Utica, N. Y.
Robert Fraser	" "
S. Kahn Sons Co.....	Washington, D. C.
Palais Royal	" "

WHOLESALE MERCHANDISE

Baltimore Bargain House...	Baltimore, Md.
Flint & Kent.....	Buffalo, N. Y.
Albaugh Dover.....	Chicago, Ill.
Alms & Doepke.....	Cincinnati, O.
The Higbee Company.....	Cleveland, O.
F. A. Patrick & Co.....	Duluth, Minn.
Burton Dry Goods Co....	Fort Worth, Tex.
J. W. Robinson Co.....	Los Angeles, Cal.
Wyman, Partridge & Co.	Minneapolis, Minn.
Savage Factories	" "
Bellas Hess & Co.....	New York, N. Y.
Robert Reis & Co.....	" "
Sol. Friedman & Co.....	" "
Charles Broadway Rouss..	" "
H. C. Capwell Co.....	Oakland, Cal.
John Scowcroft & Sons Co.	Ogden, Utah

Name of Owner	Location
M. E. Smith & Co.....	Omaha, Neb.
Sibley, Lindsay & Curr Co.	Rochester, N. Y.
Ely Walker Dry Goods Co.	St. Louis, Mo.
Butler Brothers	" " "
A. B. Spreckels.....	San Francisco, Cal.
T. Eaton Co., Ltd.....	Toronto, Canada
Rathbun & Co.....	Utica, N. Y.
Jas. Black Dry Goods Co.	Waterloo, Iowa
T. Eaton Co., Ltd.....	Winnipeg, Canada

HARDWARE

A. Schrader's Sons, Inc.	Brooklyn, N. Y.
Marshall Wells Hardware	Duluth, Minn.
Faeth Iron Works	Kansas City, Mo.
Patterson Brothers	New York, N. Y.
Stanley Works	" " "
Hackett, Walther Gates Hard-	
ware Co.	St. Paul, Minn.
J. H. Allen & Co.....	" " "
F. P. May Hardware Co.	Washington, D. C.
John Stambaugh Estate	Youngstown, Ohio

PAPER MILL AND WAREHOUSE— PUBLISHING AND PRINTING

Western Newspaper Union....	Chicago, Ill.
Poole Building	" "
The Paper Mills Co.....	" "
J. W. Sefton Mfg. Co.....	" "
Rand, McNally & Co.....	" "
Whittaker Paper Co.....	Cincinnati, O.
Dennison Mfg. Co.....	Framingham, Mass.
Graham Paper Co.....	Kansas City, Mo.
Methodist Book Concern	New York, N. Y.
Tower Mfg. & Novelty Co.	" " "
Kimpton, Hout & Co....	" " "
Hill Publishing Co.....	" " "
G. A. Bisler, Inc.....	Philadelphia, Pa.
Blake, McFall Co.....	Portland, Ore.
Boland Book & Stationery Co.	St. Louis, Mo.
Graham Paper Co.....	" " "
Lewis Publishing Co.....	" " "
Government Printing	
Office	Washington, D. C.

LAUNDRY

The Pilgrim Laundry Co.	Brooklyn, N. Y.
The Model Laundry.....	Houston, Texas
Silver Laundry & Towel Co.	Kansas City, Mo.
Wallack's Laundry	New York, N. Y.
Palace Laundry Co....	Niagara Falls, N. Y.
Holland Laundry, Inc....	Philadelphia, Pa.

WHOLESALE GROCERY

McKinney & Co.....	Binghamton, N. Y.
Hudson Bay Co.....	Calgary, Alta. Can.
Steele Wedeles Co.....	Chicago, Ill.
Boren-Stuart Co.	Dallas, Texas
Gordon Sewall Grocery Co.	Houston, Texas
Wm. D. Cleveland & Sons	" " "
Wm. Montgomery & Co.	Philadelphia, Pa.
Whiteman Brothers	South Bend, Ind.

MANUFACTURING CLOTHING

Hart, Schaffner & Marx.....	Chicago, Ill.
A. Beller & Co.....	New York, N. Y.

U. S. MAIL

U. S. Post Office	Chicago, Ill.
Hudson Terminal	New York, N. Y.
P. R. R. Terminal.....	" " "

Name of Owner	Location
U. S. Post Office.....	St. Louis, Mo.
House Office Building..	Washington, D. C.
Senate Office Building..	" " "
U. S. Post Office	" " "

WHOLESALE DRUG

Parke-Davis & Co.....	Baltimore, Md.
Morrisson, Plummer & Co.	Chicago, Ill.
Parke-Davis & Co.....	" " "
Alfred Vogeler Drug Co....	Cincinnati, O.
Daniel Stewart & Co....	Indianapolis, Ind.
Van Antwerp Drug Co.....	Mobile, Ala.
Parke-Davis & Co.	New York, N. Y.
Smith Kline & French Co.	Philadelphia, Pa.

WHOLESALE SHOE HOUSE

M. C. Kiser & Co.....	Atlanta, Ga.
Thos. G. Plant.....	Boston, Mass.
Selz-Schwab & Co.....	Chicago, Ill.
Endicott, Johnson & Co....	Endicott, N. Y.
Craddock-Terry Co.	Lynchburg, Va.
Clark Hutchinson & Co.	New York, N. Y.
Cammeyer Shoe Co.....	" " "
Morse & Rogers.....	" " "
Roberts, Johnson & Rand..	St. Louis, Mo.
Hamilton-Brown Shoe Co..	" " "

MAIL ORDER HOUSE

Sears-Roebuck & Co.	Chicago, Ill.
Sears-Roebuck & Co.	Dallas, Texas
Montgomery Ward & Co.	Kansas City, Mo.
Standard Mail Order Co.	New York, N. Y.
National Cloak & Suit Co	" " "
Sears-Roebuck & Co.	Seattle, Wash.

MISCELLANEOUS

Terminal Warehouse Co....	Baltimore, Md.
W. G. Scarlett & Co.	" " "
(Wholesale Seeds)	" " "
Boston Woven Hose & Rub-	
ber Co.....	Boston, Mass.
R. Graves Co. (Wall Paper).	Brooklyn, N. Y.
O. W. Richardson & Co....	Chicago, Ill.
Auto Parts Company	" " "
Sterling, Welch & Co.....	Cleveland, O.
Case School of Applied Science	" " "
Texas Seed & Floral Co....	Dallas, Texas
McFadden Coffee & Spice Co.	Dubuque, Ia.
Riegel Sack Co.....	Jersey City, N. J.
Albert Trostel & Sons Co.,	
(Wholesale Leather) ..	Milwaukee, Wis.
Prudential Life Insurance Co.	Newark, N. J.
Calhoun & Robbins	New York, N. Y.
Hockanum Association ...	" " "
Henry Heide (Candy Mfr.)	" " "
New Grand Central Ter-	
minal (Baggage)	" " "
Omaha Wall Paper Co.....	Omaha, Neb.
Swift & Co.	" " "
A. E. Rea Company.....	Ottawa, Can.
C. P. Lathrop Co. (Dealers	
in Lime, etc.)	Richmond, Va.
Eastman Kodak Co.....	Rochester, N. Y.
Crunden Martin Woodenware	
Co.	St. Louis, Mo.
Jos. Bancroft & Sons Co.	Wilmington, Del.
Federal Sugar Refining Co.	Yonkers, N. Y.

DIRECTORY OF OTIS OFFICES IN UNITED STATES AND CANADA

UNITED STATES

Akron, Ohio, 573 Wright Avenue
 Albany, N. Y., 40 Beaver Street
 Altoona, Pa., 1018 Sixteenth Avenue
 Atlanta, Ga., Kontz Building
 Atlantic City, N. J., 14 North Presbyterian Avenue
 Augusta, Ga., 9th & Reynolds Streets
 Baltimore, Md., Equitable Building
 Birmingham, Ala., 426 South 20th Street
 Boston, Mass., 34-35 India Street
 Buffalo, N. Y., Franklin & Huron Streets
 Charleston, S. C., 155 Meeting Street
 Charleston, W. Va., 19 Hale Street
 Charlotte, N. C., 209 North College St.
 Chattanooga, Tenn., 819 Cherry Street
 Chicago, Ill., 600 W. Jackson Blvd.
 Cincinnati, Ohio, 305 E. Fourth St.
 Cleveland, Ohio, 526-32 Leader-News Building
 Columbia, S. C., 1124 Hampton Ave.
 Columbus, Ohio, 230 North Third Street
 Dallas, Texas, Young and Akard Streets
 Davenport, Iowa, 218 East Third Street
 Dayton, Ohio, 509 East Third Street
 Denver, Colo., 1626-28 Glenarm Street
 Des Moines, Iowa, 409 West Fifth Street
 Detroit, Mich., Fifth and Fort Streets
 Duluth, Minn., 329 W. Michigan Street
 Erie, Pa., 1509 Sassafras Street
 Fort Wayne, Ind., 1216 Lake Avenue
 Fort Worth, Tex., 215 Dan Waggoner Bldg.
 Fresno, Cal., 932 "H" Street
 Grand Rapids, Mich., 7 Oakes Street
 Harrisburg, Pa., 28 South Third Street
 Harrison, N. J., 1st St. & Railroad Ave.
 Hartford, Conn., Courant Building
 Houston, Texas, 3118 German Street
 Indianapolis, Ind., 101-7 Kentucky Ave.
 Jacksonville, Fla., 210 E. Forsyth Street
 Kalamazoo, Mich., 326 E. South Street
 Kansas City, Mo., 1918-20 Wyandotte St.
 Knoxville, Tenn., 424 Wall Street
 Lincoln, Neb., 1016 K Street
 Little Rock, Ark., 220 Center Street
 Los Angeles, Cal., 218-20 E. Fourth St.
 Louisville, Ky., 206 West Main Street
 Lynchburg, Va., Hotel Carroll
 Macon, Ga., Georgia Casualty Building
 Memphis, Tenn., 292 Monroe Avenue
 Milwaukee, Wis., 115-117 Huron Street
 Minneapolis, Minn., 415 S. Fourth Street
 Mobile, Ala., 256 St. Michael Street
 Montgomery, Ala., 106 North Perry St.
 Nashville, Tenn., 148 Sixth Ave.—North
 New Haven, Conn., 124 Meadow Street
 New Orleans, La., 852 Carondelet Street
 New York, 11th Avenue & 26th Street
 Norfolk, Va., 42 Fayette Street
 Oakland, Cal., 318 Dalzell Building
 Oklahoma City, Okla., 213 W. First St.

Omaha, Neb., 1214 Howard Street
 Peoria, Ill., 233 Bridge Street
 Philadelphia, Pa., 12th & Sansom Streets
 Pittsburgh, Pa., 1201-7 Keenan Bldg.
 Portland, Me., 495 Fore Street
 Portland, Ore., 88 First Street
 Providence, R. I., 218-222 S. Main Street
 Reading, Pa., 420 Chestnut Street
 Richmond, Va., 12 South Tenth Street
 Rochester, N. Y., 8 & 10 Jones Street
 Rockford, Ill., 703 Woodlawn Avenue
 Sacramento, Cal., Forum Building
 Salt Lake City, Utah, 606-9 Judge Bldg.
 San Antonio, Tex., 610 Market Street
 San Diego, Cal., 227 Timken Building
 San Francisco, Cal., 2300 Stockton Street
 Savannah, Ga., Germania Bank Building
 Scranton, Pa., 217 Spruce Street
 Seattle, Wash., 1202-4 Fourth Avenue
 Shreveport, La., 501 Continental Bank Bldg.
 Sioux City, Iowa, 1020 Jackson Street
 Spokane, Wash., 228 S. Washington St.
 Springfield, Mass., 224 Worthington St.
 Springfield, Mo., 219 N. Campbell Street
 St. Joseph, Mo., Corby Building
 St. Louis, Mo., Locust & 23rd Streets
 St. Paul, Minn., Endicott Building
 Syracuse, N. Y., 374 West Fayette St.
 Tacoma, Wash., Perkins Building
 Tampa, Fla., S. W. Cor Zack & Tampa Streets
 Toledo, Ohio, 307 Tenth Street
 Trenton, N. J., 821 Carteret Avenue
 Tulsa, Okla., 318 First Nat. Bank Bldg.
 Utica, N. Y., 10 Catharine Street
 Waco, Texas, 1512 Amicable Building
 Washington, D. C., 303-8 Metropolitan Bank Building
 Wheeling, W. Va., Schmulbach Building
 Wichita, Kan., 123 E. First Street
 Wilmington, Del., 10th & Market Streets
 Worcester, Mass., 311 Main Street
 Youngstown, Ohio, 120 E. Boardman St.

CANADA

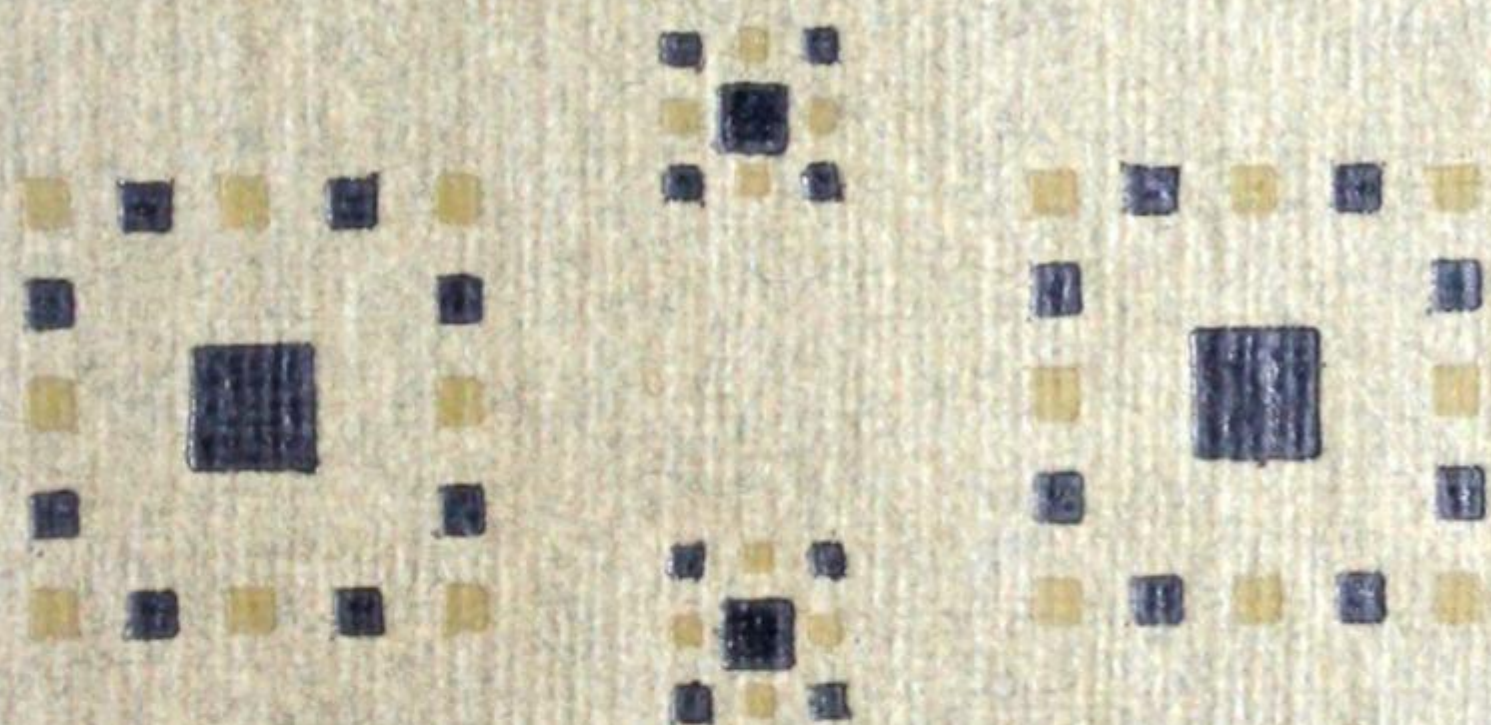
Calgary, Alberta, Tees & Persse Bldg., 322-6 Ninth Ave. W.
 Edmonton, Alberta, 10187 104th Street
 Halifax, Nova Scotia, 146 Hollis Street
 Hamilton, Ont., Victoria Ave. North
 Montreal, P. Q., 368 St. James Street
 Ottawa, Ontario, 254 Queen Street
 Quebec, P. Q., Dominion Bldg., 126 St. Peter Street
 Regina, Saskatchewan, Cor. Eleventh Ave. & Lorne Street
 Toronto, Ontario, 50 Bay Street
 Vancouver, B. C., 1152 Mainland Avenue
 Victoria, B. C., 526 Chancery Lane
 Winnipeg, Manitoba, 316 Cumberland Avenue



OTIS
ELEVATOR
COMPANY

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ESCALATORS





OTIS ESCALATORS



OTIS
ELEVATOR COMPANY

OFFICES IN ALL PRINCIPAL CITIES
OF THE WORLD

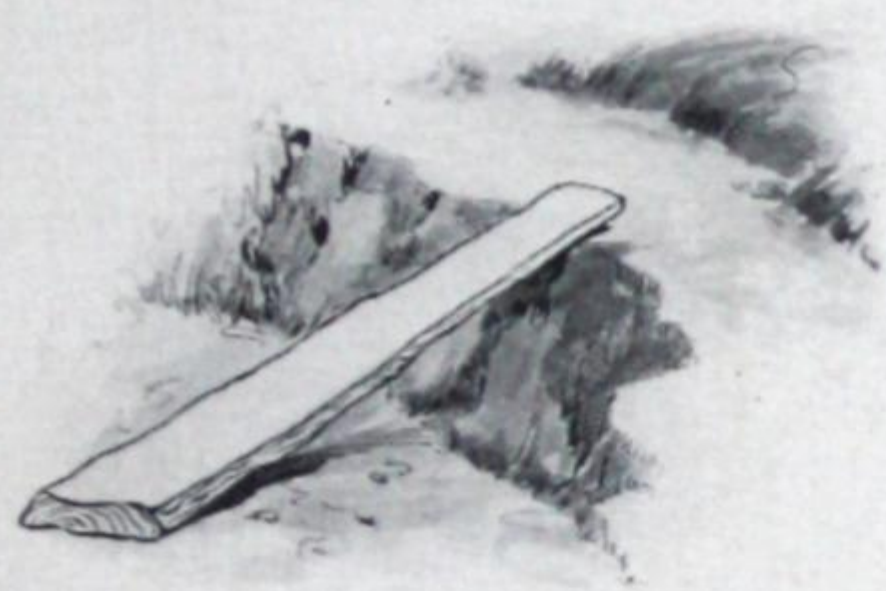
ESCALATOR

The word Escalator was coined in the latter part of the year 1895. Its root is found in the Latin "*Scala*." With "E" as a prefix and "tor" as a suffix, the entire word may be roughly translated, "means of traversing from"

THE ESCALATOR



THE inclined plane is one of the simplest mechanical elements. When man wanted to go from one level to another he first built himself a ladder, stretched it from the ground to a tree and scaled the distance. Then he discovered that it was easier to ascend at an incline than to pull himself up vertically, so he fashioned his primitive inclined plane, a crude device, but one that enabled him more easily to make his ascents, and to trundle up heavy loads.

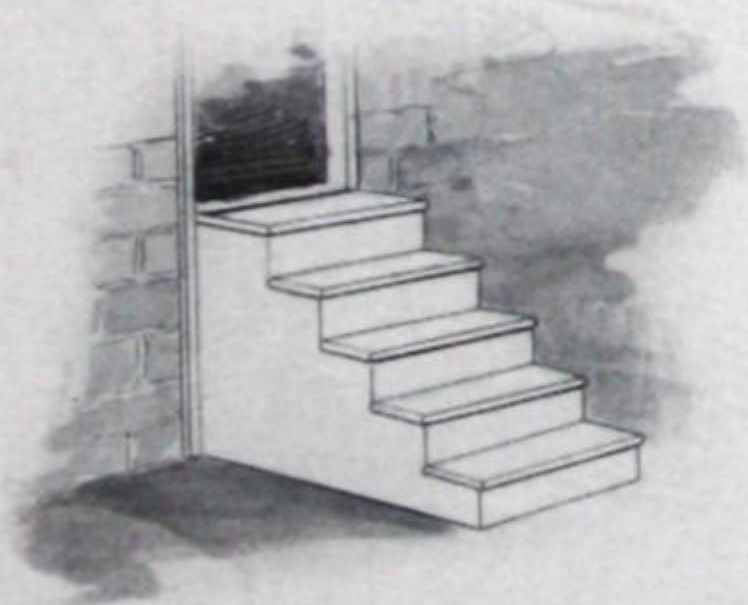


Then, from the inclined plane evolved the stairway, the most useful and comfortable application of the idea.

The stairway, the ladder, the inclined plane, all are useful, but all require human effort to bring one from a lower to an upper level.

Eliminate the physical effort and you have the ideal means of ascent and descent for short rises. The sug-

gestion to *move the stairway* was the solution; so we placed the stairway on a set of wheels, connected it to a motor and made the *Escalator*; just as simple and primitive in its idea as the rough plank which our ancestors employed, but infinitely more useful.





FIRST ESCALATOR
PARIS EXPOSITION — 1900

Prior to the year 1900 the Escalator was unknown to the public, but faithfully and steadily our engineers had been working to perfect it, and in 1900 at the Paris Exposition, the first Escalator was introduced. That very Escalator is still in operation in one of our largest department stores.

Its instant popular approval insured its success.

The public had been patiently awaiting a moving stairway for years. Now Escalators are operating in all parts of the world; in the gigantic railway terminals; in our department stores and large mills; in our theatres; in the elevated and subway stations of our great cities; everywhere, in fact, where it is necessary to keep thousands of people moving constantly and rapidly.

The success of the Escalator in solving the problem of inter-floor travel is due to its continuity of motion and its enormous capacity. The Escalator is constantly moving; you may step upon it at any moment and be carried upward or downward at a moderate rate of speed, comfortably, safely and without physical effort. It has been aptly called "an elevator with the doors always open." There is no time lost in loading, starting, stopping and unloading, and consequently its capacity is tremendous; approximately 11,000 people can be carried in an hour without overloading the machine.

There are two types of Escalators, known as the Step and Cleat types. Briefly their construction and operation are as follows:

The Step type begins as a moving platform; then as it goes onward it breaks into steps rising slowly into a perfect staircase, but moving steadily and noiselessly a little faster than one can ordinarily walk. On either side, a hand rail of flexible material moves upward at the same speed as the stairs,



STEP TYPE

thus affording the passengers a secure support as they ascend. At the top the steps flatten out into a moving platform again from which the passenger steps to the stationary landing on the same level so easily that the transition from the moving to the stationary surface is hardly noticed. At the upper landing, the side corresponding to the balustrade of an ordinary staircase turns in-

ward and the moving platform disappears under it. The moving hand rail continues along this balustrade so that a passenger who had not noticed that the top had been reached would be gently pushed off to continue on his way. An electric motor drives the mechanism running on rollers on an inclined plane, which supports the treads and risers at the proper angle.



CLEAT TYPE

The Cleat type is a moving stairway without the

steps. It is an endless moving platform formed of hardwood cleats located in longitudinal ridges and grooves. There is a handrail on either side moving at the same speed. The platform revolving over the lower sprocket glides through the prongs of a comb at the lower level and journeys upward at a moderate speed. At the upper landing it disappears through a comb and revolving over a sprocket, travels downward. The passenger slides off upon the prongs of the comb at the top in safety and without jar or shock.

Both types of Escalators can be made to operate either up or down, by employing a reversing switch. Such machines are known as Reversible Type Escalators. When traffic must be handled in both up and down directions simultaneously, two machines are used, one moving upwards and one downwards. Such an arrangement is known as a Duplex Escalator.

Wherever large numbers of people are to be handled, the Escalator is applicable. On the following pages are illustrated some of our most interesting and important installations. Our engineers are always glad to suggest and recommend types of apparatus suitable to particular requirements, and any of our offices will gladly supply full information and a detailed description of the machines.

THE ESCALATOR IN THE RAILWAY TERMINAL

Every railway terminal where the tracks are either elevated or depressed, or where passengers must be moved from level to level, needs Escalator service.

The watchful and progressive railroad companies have spared no expense to make travel pleasant and comfortable. They have provided safe and luxurious coaches, the speediest of electric and steam locomotives



ESCALATOR—PENNSYLVANIA RAILROAD TERMINAL
NEW YORK CITY

and the safest of signal systems; and now the time is ripe to furnish the public a quick, easy access to and exit from trains in the station.

The Pennsylvania Railroad has inaugurated this movement at the Thirty-fourth Street exit of its New York terminal, by an Escalator installation operating between the mezzanine floor in the station and the sidewalk level, a distance of about twenty-six feet.



ESCALATOR—PENNSYLVANIA RAILROAD TERMINAL
VIEW TAKEN DURING MORNING RUSH HOURS

During the morning hours the service is taxed practically to its capacity, about 11,000 people per hour.

That the Escalator is popular with the traveling public is evident from a glance at the illustration. Ninety-eight per cent of the people using this exit, travel on the Escalator. The old-time stairway adjoining has been practically abandoned. No one will sap his strength or waste his energy in climbing stairs when he can ride, and many people will walk considerable distances to ride one or two stories on an Escalator.

The Railway or Transportation Company that installs Escalators for its patrons is bound to realize heavily on its investment. The quick and comfortable transfer of passengers is a great deal in itself, but the good will and friendly attitude of the public is worth in advertising value many, many times the initial expense of the Escalators.



ESCALATOR — WOOD WORSTED MILLS
LAWRENCE, MASS.

THE ESCALATOR IN THE MILL AND FACTORY

There is no more interesting example of the large place that the Escalator has found for itself in commercial fields than the installation in the Wood Worsted Mills at Lawrence, Mass. To those who have been accustomed to look upon the Escalator as an unnecessary luxury, let them but study for a moment the practical foresight that led the largest worsted mill in this country to equip its plant with two batteries of four Escalators (Step Type), each.

To serve the 6,500 operators employed in the mills, the eight Escalators are run upward in the morning, down again at noon, upward after lunch hour and finally downward at night, carrying the employes between the second and sixth floors.

The time of the trip for the individual passenger to or from the sixth floor is about two minutes, and each



ESCALATOR — WOOD WORSTED MILLS
LAWRENCE, MASS.

of the machines will carry ten to eleven thousand persons per hour. The illustration shows the operators leaving the mill at the noon hour. The buildings are emptied rapidly and noiselessly.

The machines are motor driven and can be started, stopped or reversed at will. As they operate a total of about only one hour per day, and as low power motors are used, the annual operating costs are very small.

The profitable and practicable feature of the Escalator, from the viewpoint of the owner, is the increased efficiency of each operator due to the elimination of stair climbing. While it is almost impossible to figure the saving in dollars and cents, a careful study has convinced the directors of the mills that in the course of a year, a vast sum of money is saved through the conserved energy of the employes.

Then, too, it has been learned that expert operators are more easily obtained in mills where their welfare and health are conscientiously cared for, and the Escalator is now looked upon as one of the most potent forces in the accomplishment of that purpose.



ESCALATOR EXIT
PARK STREET STATION, BOSTON, MASS., SUBWAY

THE ESCALATOR FOR THE SUBWAY, ELEVATED STATION, AMUSEMENT PARKS AND MUNICIPAL APPROACHES

All of our big cities have their problems, and the greatest of these is transportation. Indeed, in the largest cities of the world the traffic question is one that demands the study of the keenest minds, and those cities that accept every method of improving their transportation conditions, are and should be proud of their enterprise.

The crowds must be kept moving; the slightest congestion or block causes annoying delays to thousands of people.

In New York, Boston, London, and other large cities where the elevated and subway systems carry hundreds of thousands of people daily, the Escalator has been installed at many of the busiest centers, and other stations are now being equipped.

A glance at the illustrations shows a few of the New York City Elevated Stations and the Boston Subway



STEP TYPE ESCALATOR
MANHATTAN STREET SUBWAY STATION, NEW YORK CITY



STEP TYPE ESCALATOR
SIXTH AVENUE AND THIRTY-THIRD STREET, NEW YORK CITY



CLEAT TYPE ESCALATOR
WESTCHESTER AND INTERVALE AVENUES, NEW YORK SUBWAY



CLEAT TYPE ESCALATOR
EIGHTH AVENUE AND 125TH STREET, NEW YORK CITY



STEP TYPE ESCALATOR
PARK STREET STATION, BOSTON, MASS., SUBWAY

Stations where Escalators are now operating. It is of common occurrence that persons will walk out of their way to use an elevated or subway station which is reached by an Escalator. The fatigue of stair climbing is shunned by even the strongest, while, to the weak and infirm, the Escalator has been a real blessing.

Public sentiment is strong in demanding more Escalators. One never thinks of walking up a long, tedious flight of stairs in a building where there is an elevator, and no more should he submit to stair climbing in the



DOUBLE FILE CLEAT TYPE ESCALATOR
PARK STREET STATION, BOSTON, MASS., SUBWAY

subway or elevated station, where the Escalator is the *only* practicable means of ascent, for the great crowds that must be carried.

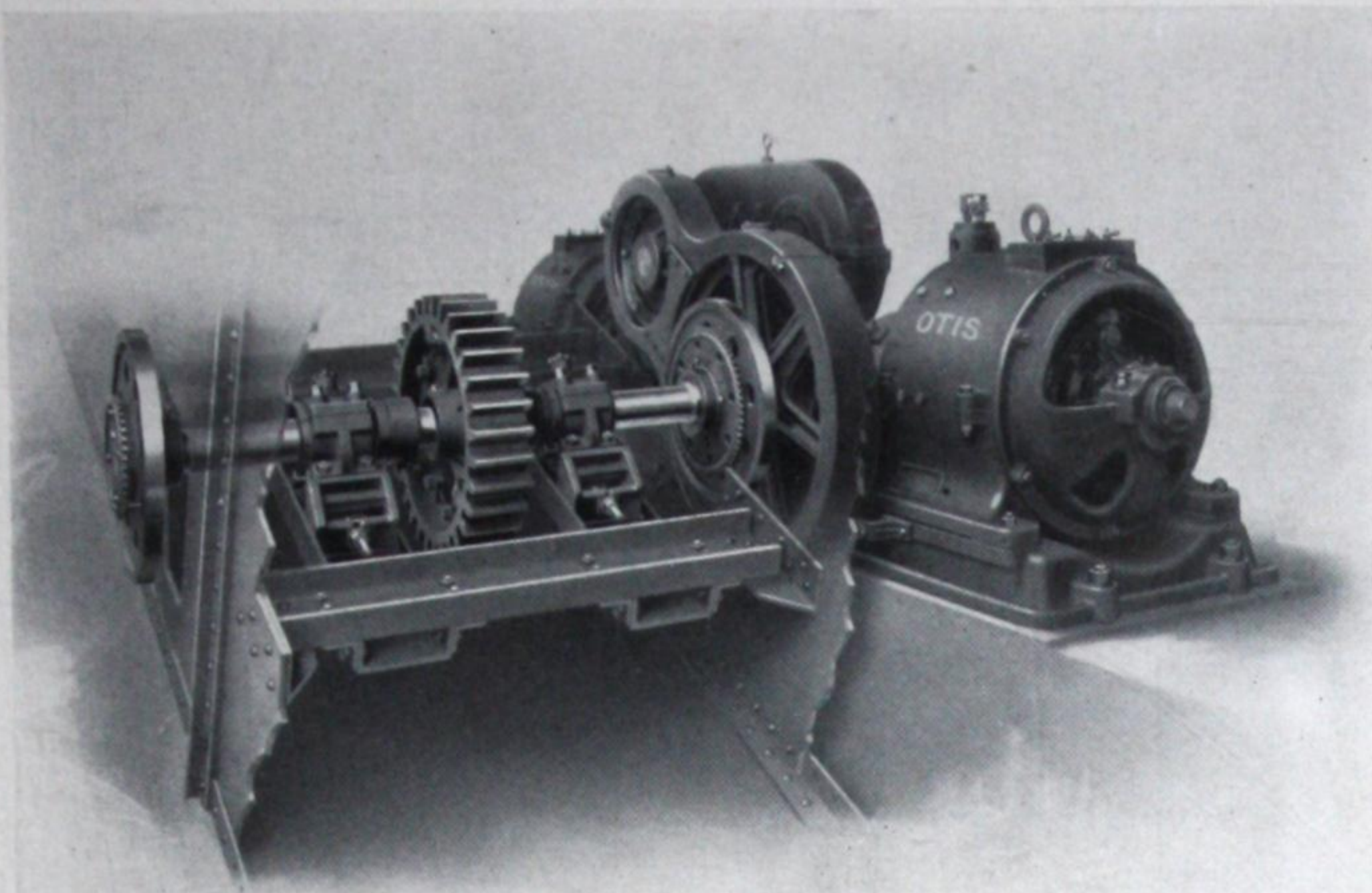
The Amusement Parks have been quick to add Escalators to their equipment, using them as a means to circulate the crowds to their various attractions. They are very valuable for this purpose and in addition are proving to be advertising factors of inestimable value.



ILLUSTRATION FROM *ILLUSTRATED LONDON NEWS*
SHOWING STEP TYPE ESCALATORS, EARL'S COURT STATION, LONDON, ENGLAND

THE ESCALATOR IN THE LONDON SUBWAY

The hearty welcome that the Escalator received in England is worthy of special mention. In October, 1911, two Escalators of the Step Type, one ascending and



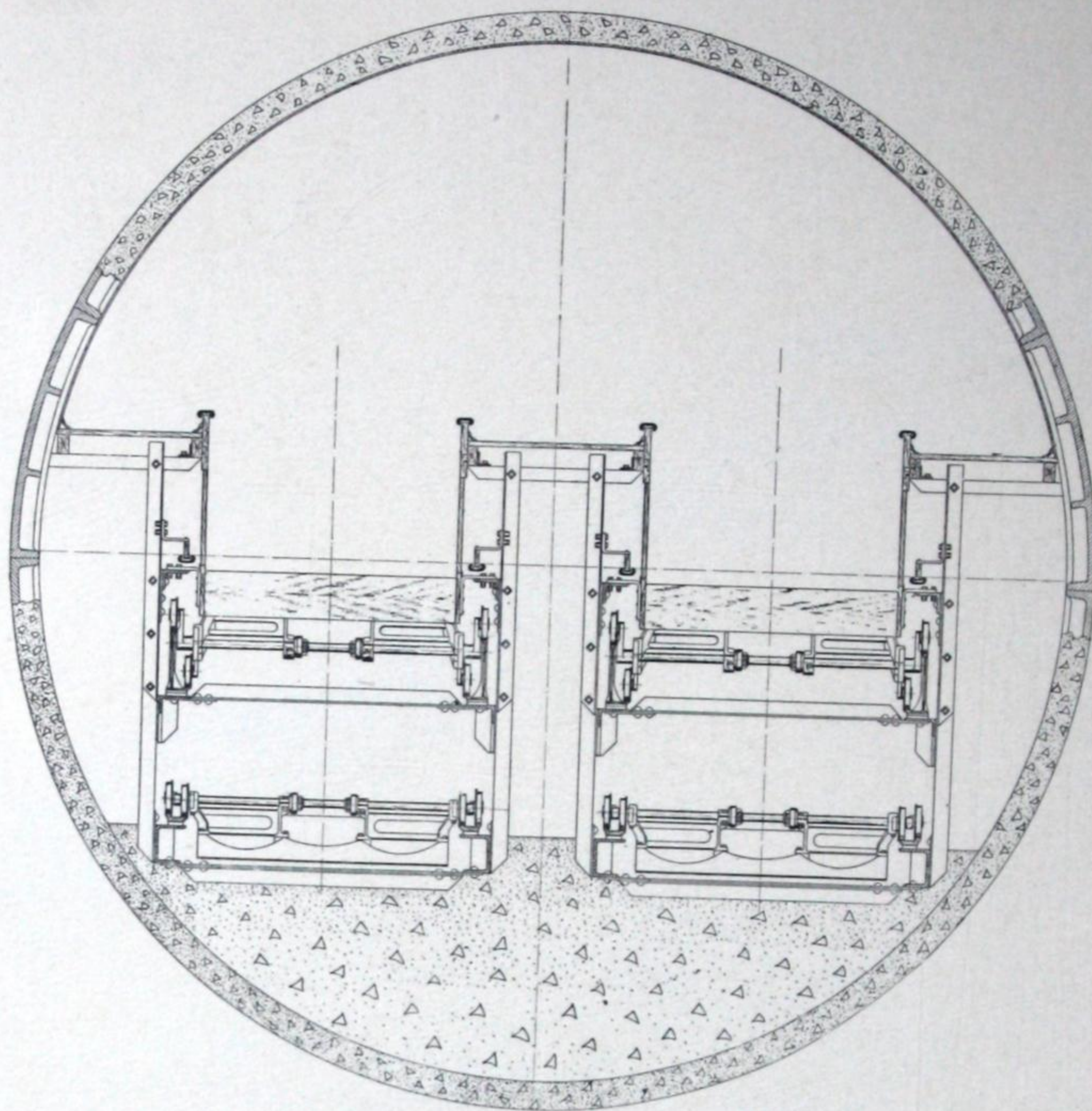
MOTOR AND REDUCTION GEARING OF STEP TYPE ESCALATOR AT
EARL'S COURT STATION

one reversible, were installed at the Earl's Court Station, to connect the Piccadilly Tube with the District Railway, London, England.

With a carrying capacity of 10,800 people per hour in each direction, the Escalators proved to be so invaluable that soon two more were installed and ten others are now being built; a battery of fourteen Escalators that will have a total capacity of over two million passengers a day.

The driving mechanism for each Escalator consists of one standard bronze sprocket wheel with a spur gear reduction to a double worm geared elevator outfit, with a 50 H. P. motor at each end of the worm. These motors are coupled to the worm shaft in such a way that either one or the other may be used at will, thus avoiding shut-downs due to minor motor troubles.

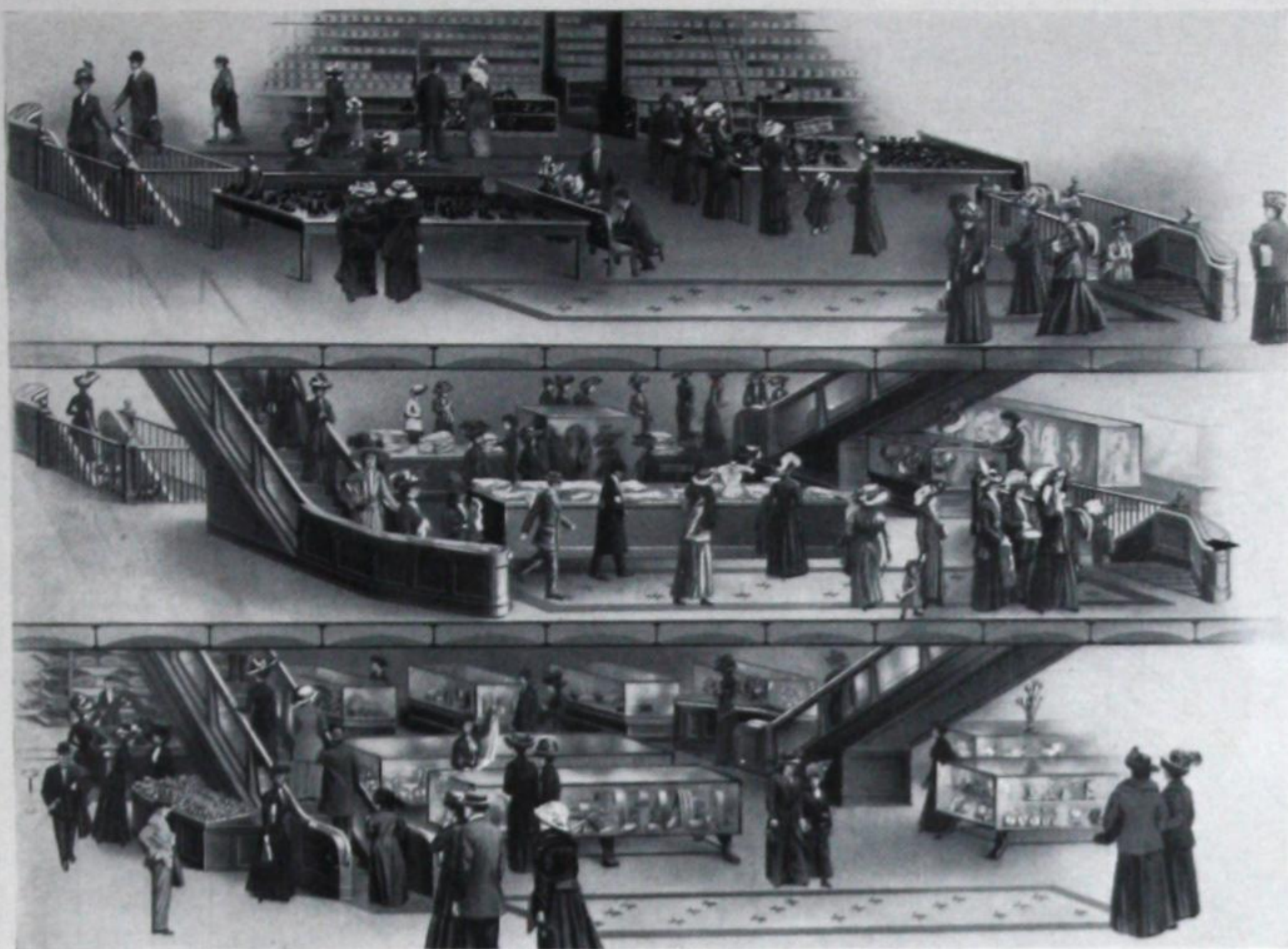
The accompanying illustration of the Escalator appeared in the *Illustrated London News* which commented



STEP ESCALATORS

SECTION THROUGH INCLINE, SHOWING ASCENDING AND DESCENDING MACHINES

on the Escalator as follows: "London has come into line with New York in the matter of the Escalator, and two moving staircases now connect the Picadilly Tube and the District Railway at Earl's Court Station. The Escalators are proving not only very useful, but providing Londoners and country cousins alike with a new amusement. There have been not a few so fascinated by the device that they have traveled up, then down, and up again before the curiosity and desire for a fresh sensation have been satisfied. Passengers on their way to the city have even been seen to leave a train, go up with the stairs and down with the stairs, and catch the next train."



THIS ARRANGEMENT, SHOWING A BATTERY OF ESCALATORS, WILL PRODUCE PROPER CIRCULATION IN A DEPARTMENT STORE OBTAINABLE BY NO OTHER METHOD

THE ESCALATOR IN THE DEPARTMENT STORE

The Department Store is an ideal location for an Escalator. No other one class of buildings has lent itself so readily to extensive installations and nowhere has the Escalator been more valued as a sound commercial investment.

It is only necessary to observe the large number of stores with Escalators in various cities throughout the United States, to realize that the Escalator in the Department Store has come to stay. It supplements beautifully the functions of the elevator, and does much that the elevator, from the very nature of its construction, cannot do.

The opinion once general that the store equipment should be proportioned to the average size of business, is no longer held by the more progressive merchants,



STEP TYPE ESCALATORS
HENRY SIEGEL COMPANY STORE, BOSTON, MASS.



STEP TYPE ESCALATOR
DENVER STORE, DENVER, COLORADO



DUPLEX CLEAT TYPE ESCALATOR
R. H. WHITE & COMPANY STORE, BOSTON, MASS.
INSTALLED IN 1903

and they now regard it as essential that facilities should be planned to meet the requirements of the largest business of a very short season. This is certainly logical, for business is done when the people are in the store, and if at such times the facilities are inadequate, it results in loss of sales; furthermore, in equipping for the largest day's sales, the merchant has provided also for the growth of the average business without overtaxing his resources.

The "radius of action" of a piece of elevating apparatus is not large and for that reason the apparatus should not be "bunched" or crowded in one part of the floor. It has been interesting to watch the growth of the Escalator idea in the stores which have introduced it. In a number of cases the first installation was a single machine to be followed later by other machines in the upper floors. Then comes the second stage of



DUPLEX CLEAT TYPE ESCALATOR
SIEGEL COOPER & COMPANY, CHICAGO, ILL.

the Escalator idea, namely, a duplication of the equipment by installing Escalators at other points on the same floor, to bring those points within the "radius of action" of elevating facilities.

At the outset it was believed unnecessary to provide descending Escalator service, but from observations in stores fully equipped with both ascending and descending Escalators, it has been learned that descending service is not only a convenience but a means of a very



STEP TYPE ESCALATOR
R. H. MACY & COMPANY, NEW YORK CITY

greatly increased circulation, by reason of inter-floor travel.

No enterprising or progressive merchant any longer clings to the old idea of crowding the greatest possible number of departments and counters containing the staple year-round sellers, on the first floor, with a space allotment to each of less than might be profitably employed, and of employing the upper floors for departments of short seasons and for large space devoted to lines of a very limited number of sales.

The Escalator has changed this condition by providing a uniform circulation throughout the store. It has made the upstairs space just as valuable as ground floor space, and has readjusted the old-time ideas as to the aisles and location of departments.

We have studied long on the problem of circulating humanity through the Department Store, and it has become clear to us that the problem, though complex to a greater degree, is as truly a matter for an engineer as are the simpler problems of circulating steam, electricity and the like. We have collected data of all sorts on which to base our recommendations for the aisles, department locations, etc., and are more than willing to lend ourselves and our experience to those considering Escalator requirements.

THE ESCALATOR IN THE THEATRE

The Escalator in the theatre is more than an innovation. It is a valuable adjunct to the equipment of every playhouse.

The theatre owner and manager is at his wits' end to fill the balconies and galleries. The moving picture show, with its cheaper prices, has appreciably detracted from the balcony and gallery patronage of the "legitimate" theatre. A few theatres, however, have found that by making the upper seats convenient of access and egress, thousands of amusement-loving people, who cannot afford to pay prices for orchestra seats, will avail themselves of the Escalator to reach the balconies.

To this end the Escalator has been used in several theatres with pronounced success. In one popular theatre where reserved seats are not sold, the management, by having an Escalator, does not open the doors



CLEAT TYPE ESCALATOR
BIJOU DREAM THEATRE, BOSTON, MASS.

to the orchestra until the balcony is well filled, and it has been found that the Escalator makes the balcony seats just as popular as the orchestra seats, if not more so.

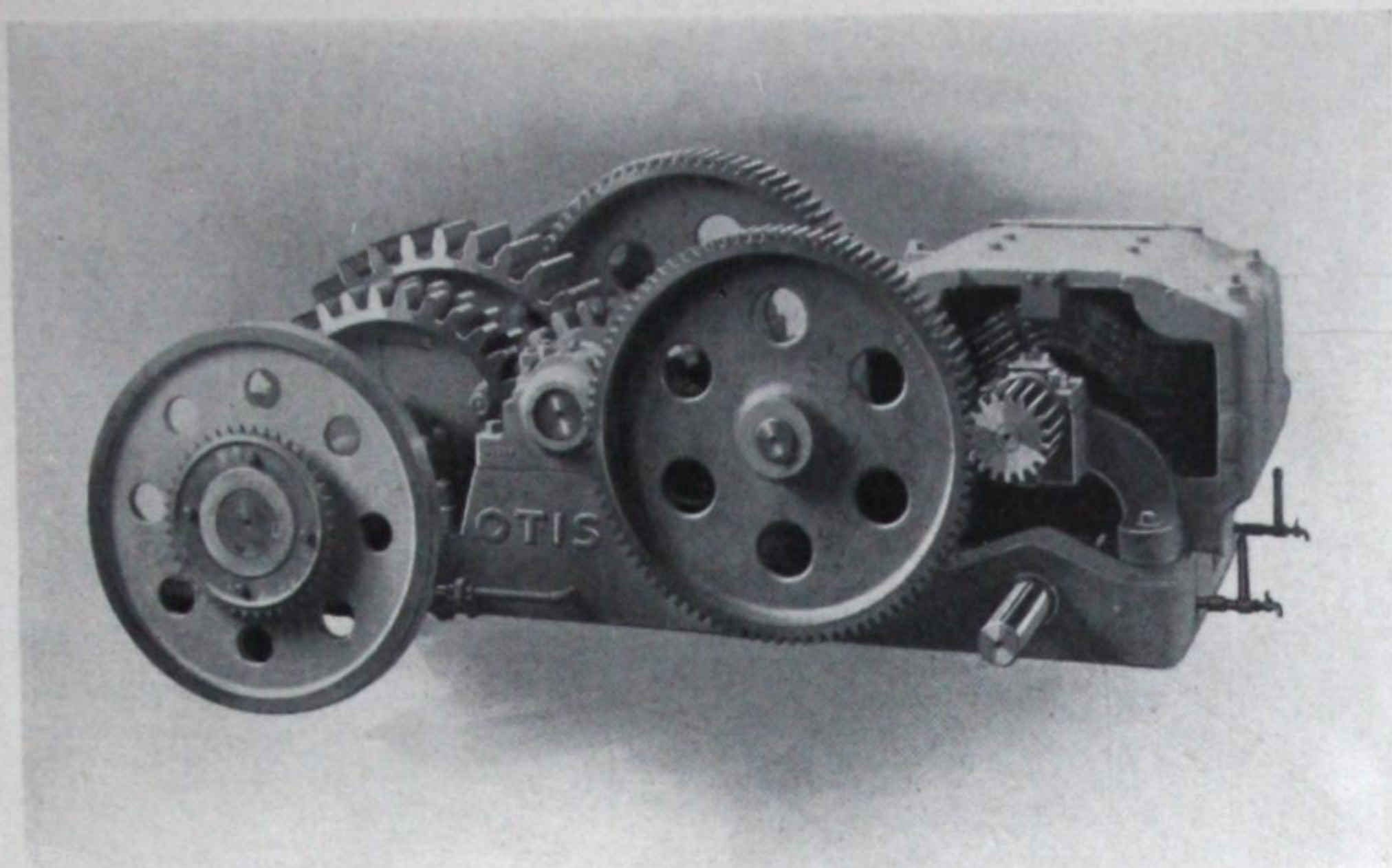
The Escalator is looked upon, also, as invaluable in case of fire. The people appreciate that, because of its tremendous capacity, it will carry them quickly to safety, and this very fact allays fear which otherwise might cause panic.



CLEAT TYPE ESCALATOR
GORDON-OLYMPIA THEATRE, BOSTON, MASS.

It will be observed that the Escalator is sightly and ornamental. It is an added architectural attraction to the finest appointed theatres.

The two Boston theatres illustrated here have led the way and there are several others whose managers have announced their intention of installing Escalators.



MOTOR AND REDUCTION GEARING STEP TYPE ESCALATOR

The illustration shows a form of Escalator driving machinery which is employed in situations where it is necessary to place this mechanism within the body of the Escalator proper. It consists of a standard Otis motor of a capacity suitable for the work to be performed, with spur gear reductions to the main driving shaft on which is mounted the bronze sprocket wheel. In situations where space is available at the side of the Escalator beneath the upper landing we prefer to employ a worm gear driving apparatus, which has the advantage of being more accessible for purposes of inspection.

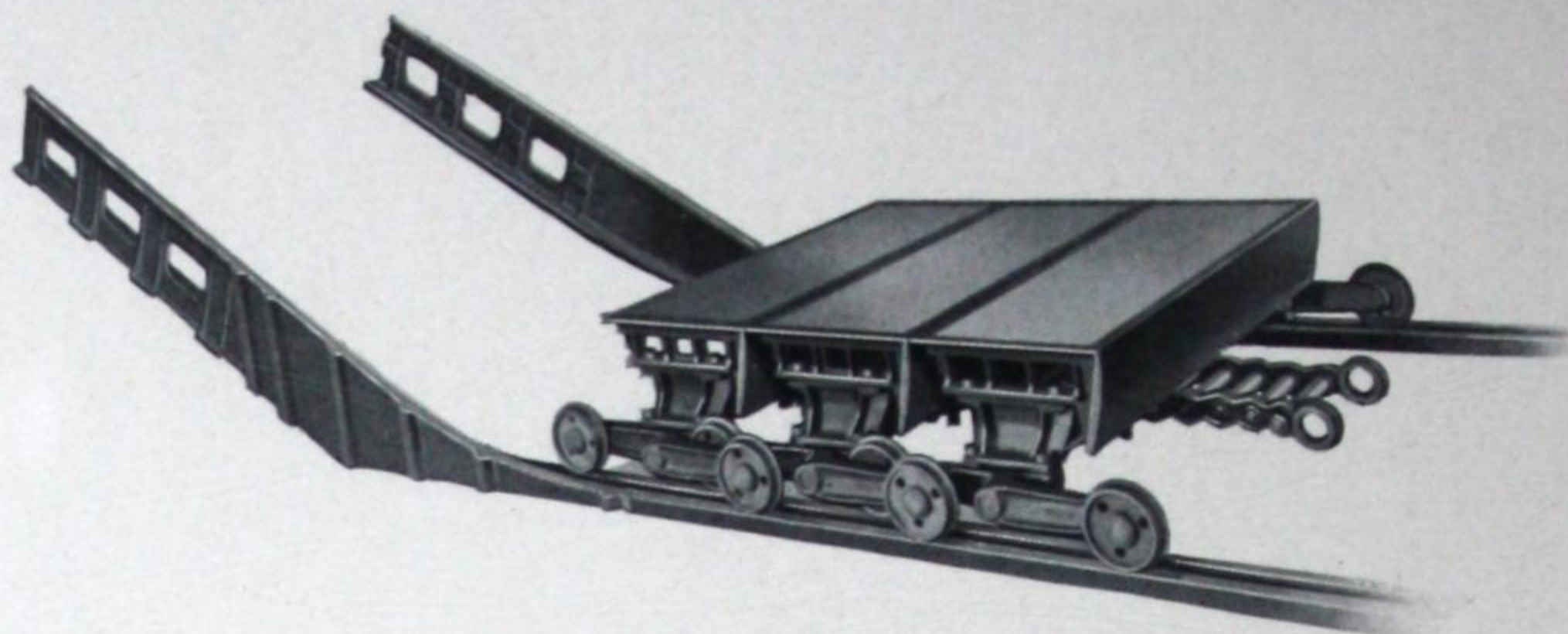


FIGURE I

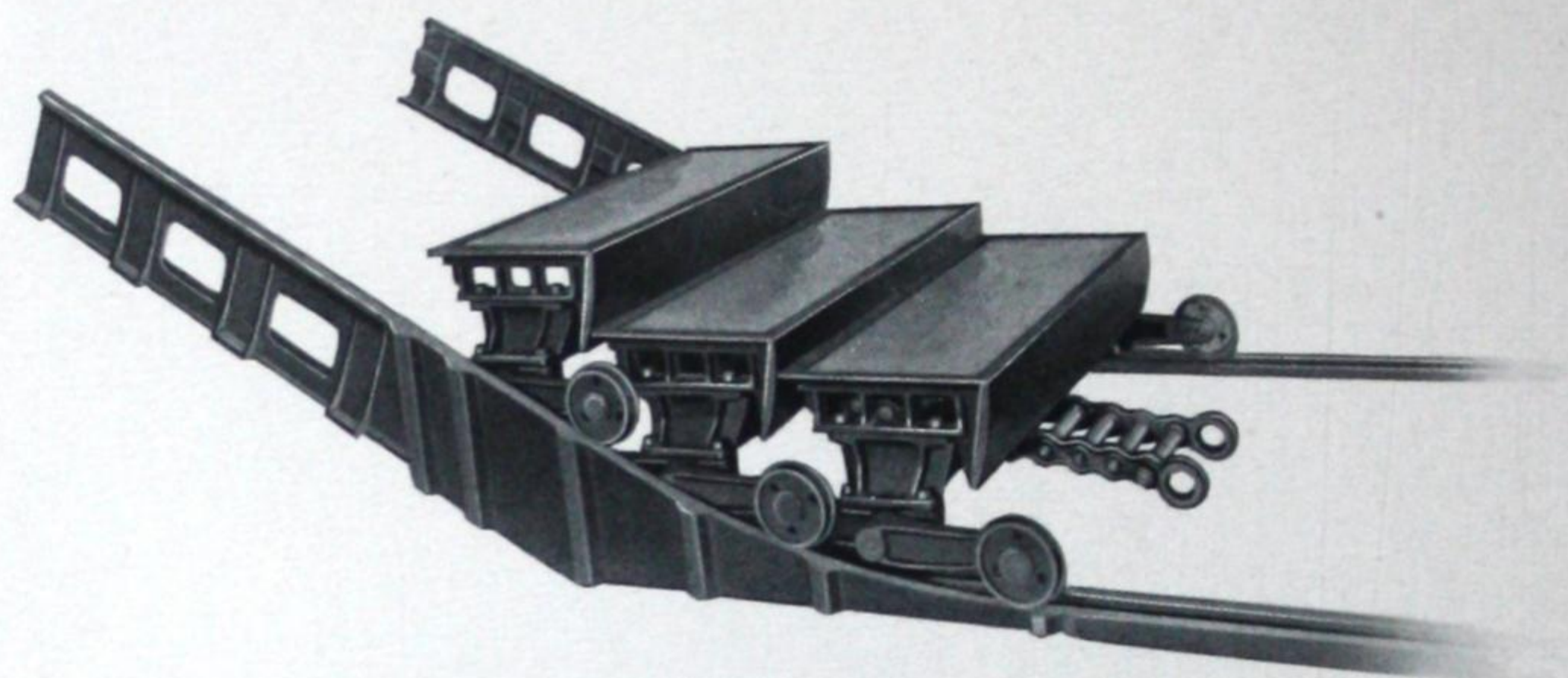


FIGURE II

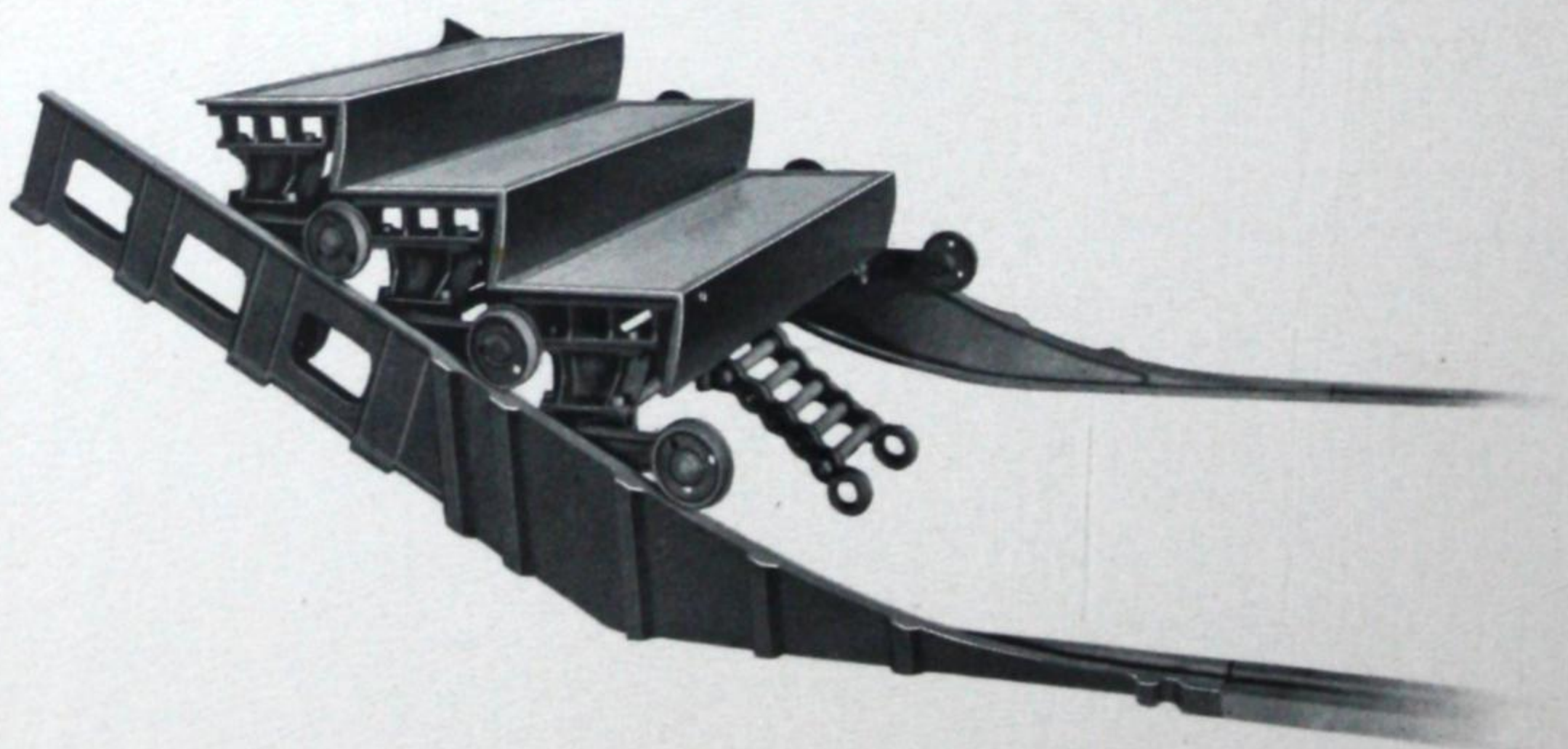


FIGURE III

THE TREADS

(STEP TYPE)

The accompanying cuts are illustrative of the step action at the lower end of the Escalator. It will be noted that on the landing the treads are flush (Fig. I), forming a moving platform on to which the passenger steps from the stationary floor plate. As they approach the incline, the wheels rise on the curved tracks producing a step formation gradually at first and more rapidly thereafter (Fig. II), until the incline portion is reached where we have the full riser development (Fig. III). The steps continue up the incline without altering their relative positions, until the upper end of the machine is reached, where the reverse action of that already described takes place and the steps once more flatten into a moving platform from which the passenger alights to the stationary floor.

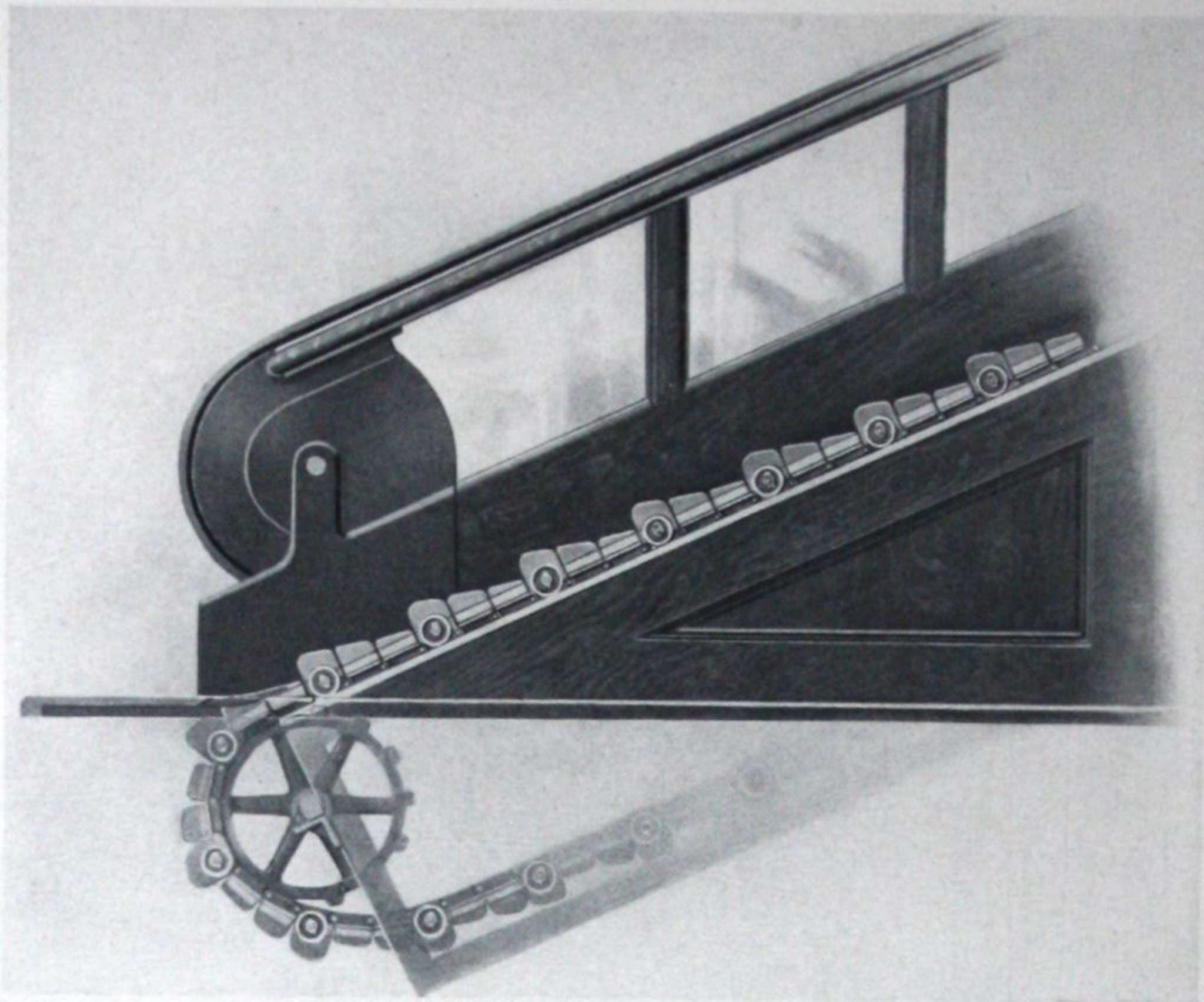
THE TREADS

(CLEAT TYPE)

The illustration on page 30 shows the construction of the tread for the Cleat type of Escalator and it has proven itself to be very practicable and safe in operation.

The step treads are so nearly horizontal, the angle being only $12\frac{1}{2}$ degrees, that the foot of the passenger is in a very comfortable position while riding either up or down the Escalator.

They are made of hard maple bolted to a steel bushed chain which passes over sprocket wheels at the upper and lower ends of the machine. Attached to the treads at intervals of one foot are self-lubricating iron wheels which roll upon steel tracks. The surface of the moving plane is produced by a series of parallel cleats about one inch apart, forming longitudinal ridges and grooves.

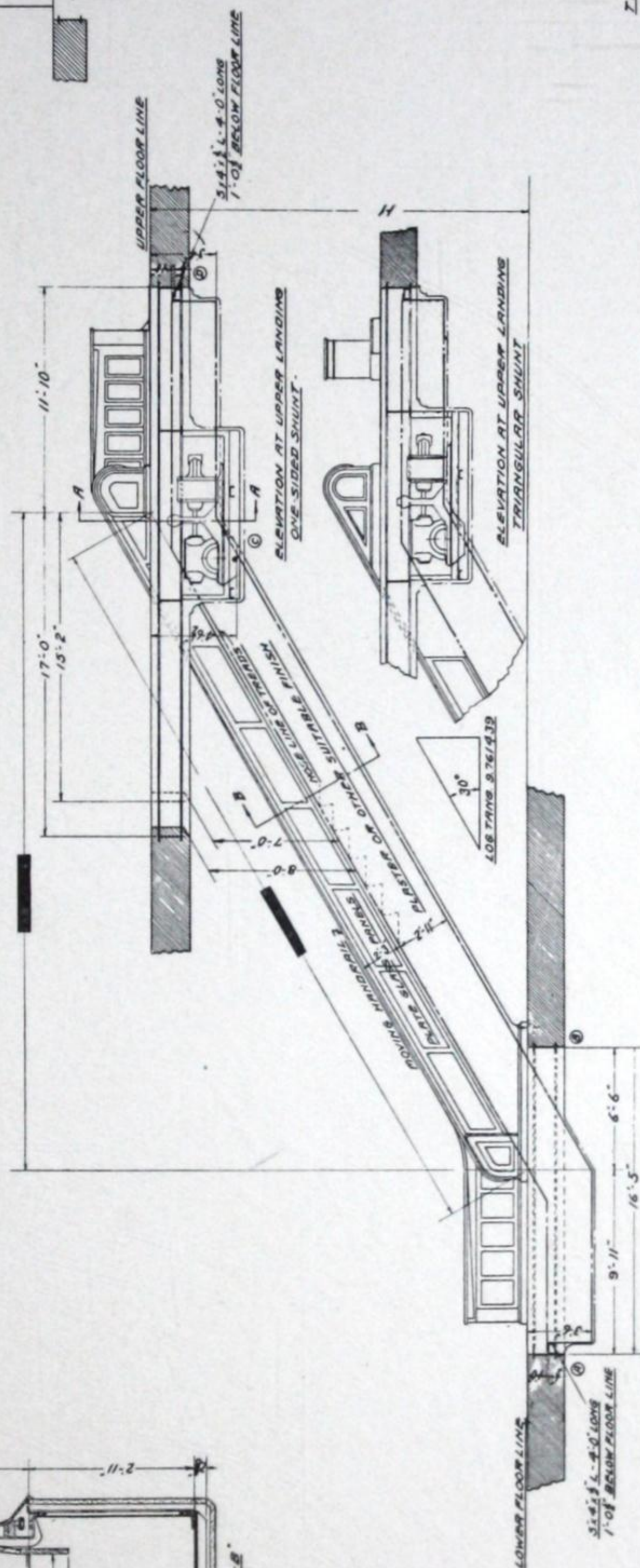
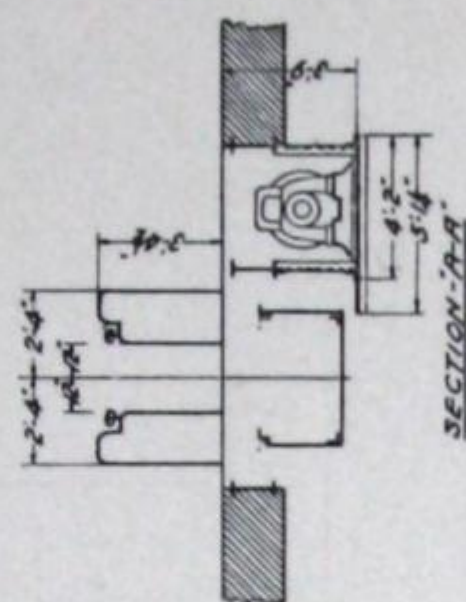
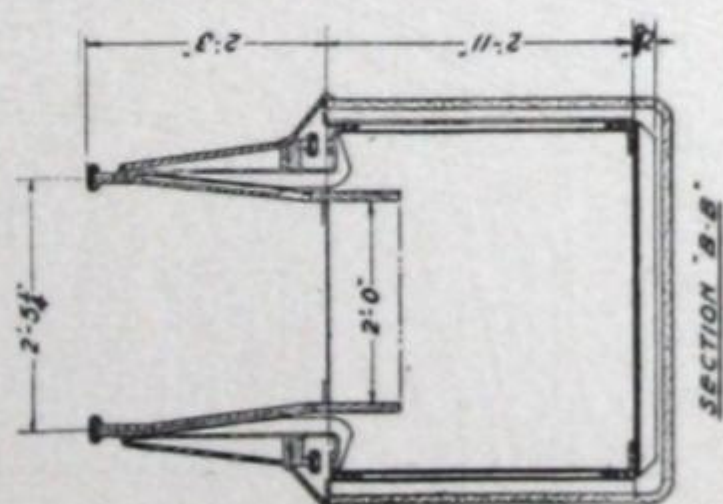
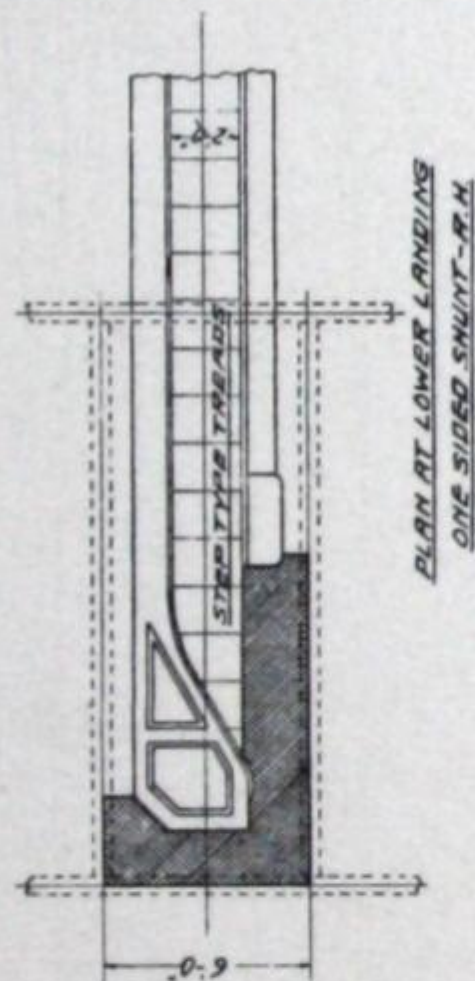
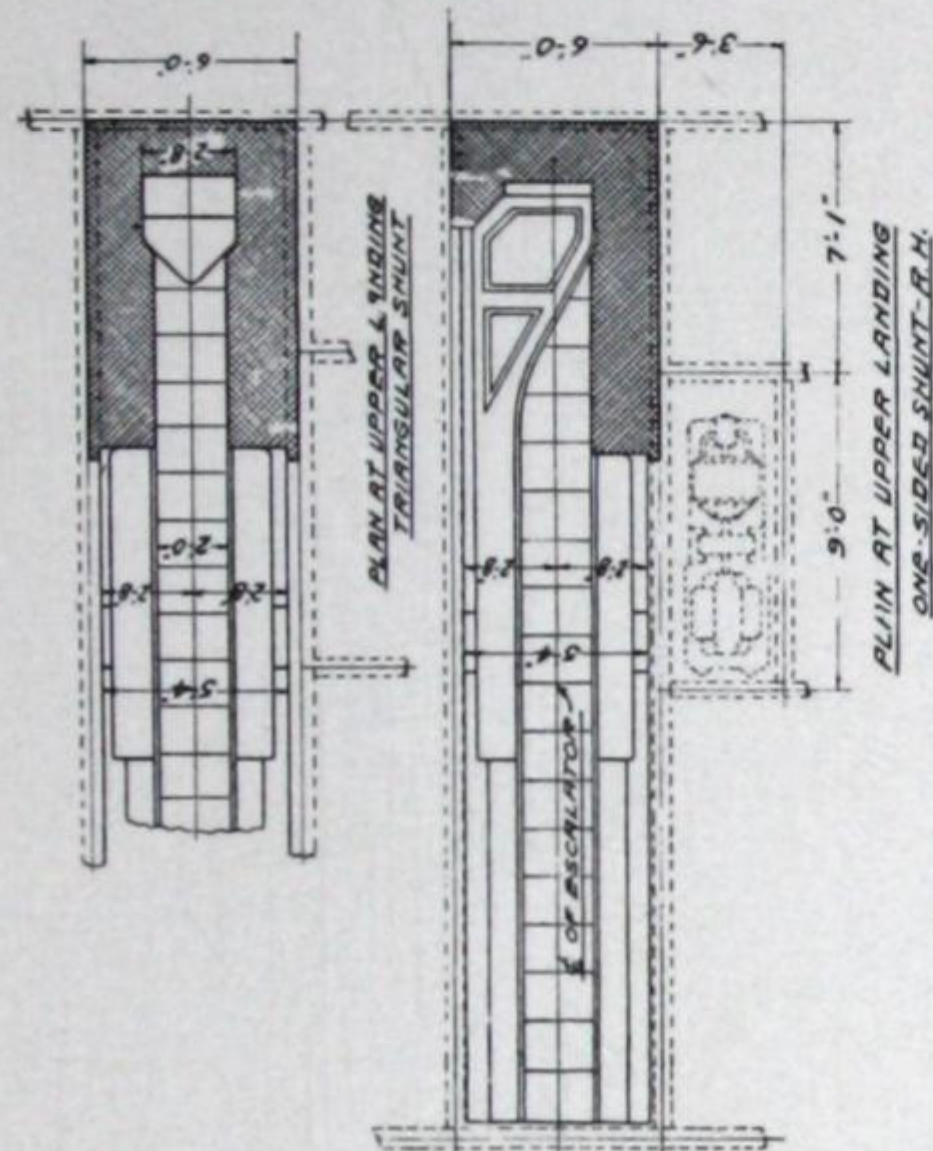
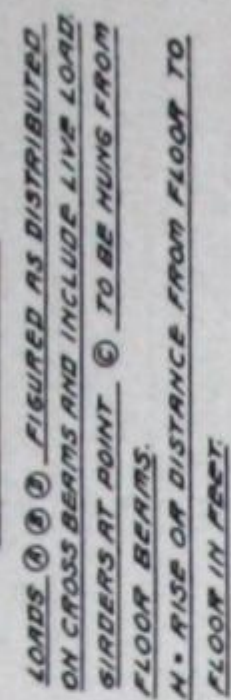


THE CLEAT TYPE TREAD

The object of this construction is to enable the passenger to be landed safely and comfortably at the floor line upon a comb-shaped plate, the prongs of which project into the grooves between the ridges of the treads; the passenger is therefore transferred to the landing without any attention on his part.

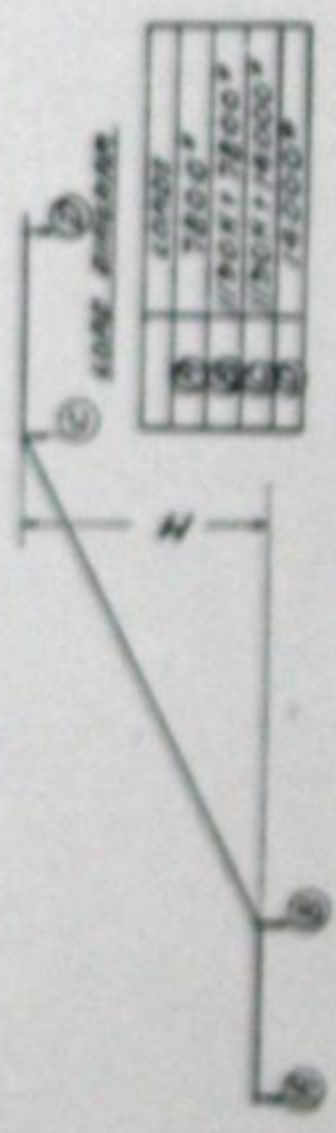
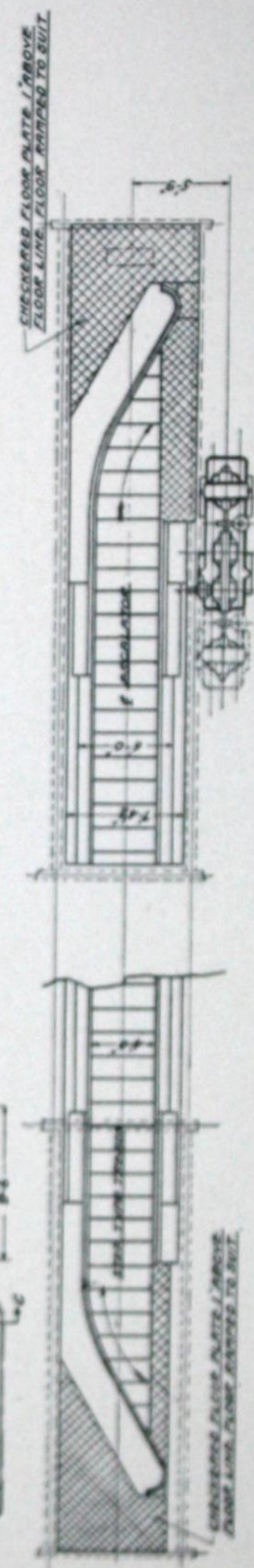
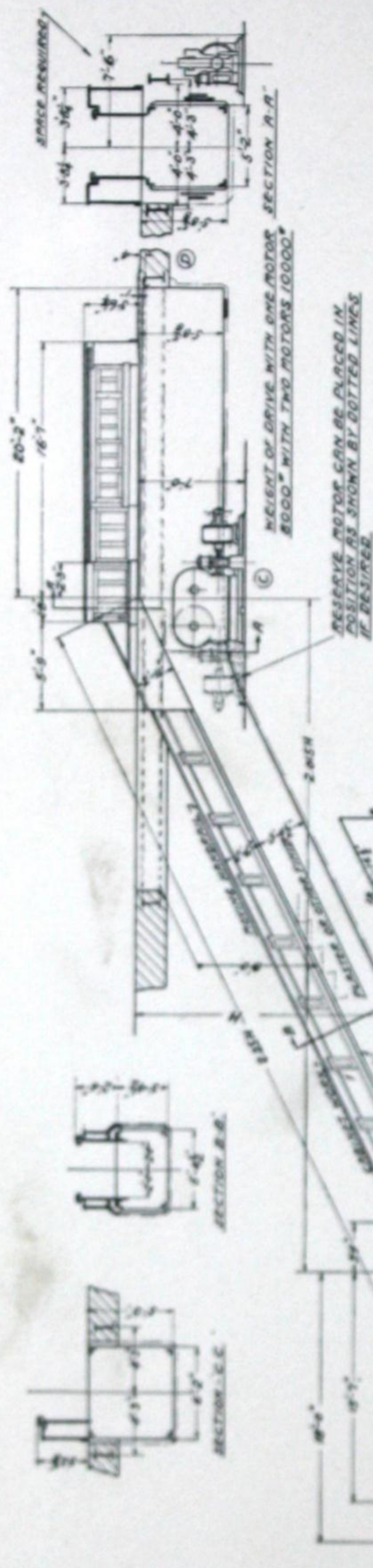
TYPICAL LAYOUTS

On the following pages are shown typical layouts of the Step and Cleat types of Escalators. They are intended to give necessary preliminary information to architects in estimating the space requirements and necessary floor openings for any installation.



TYPE "3PE" ESCALATOR
TYPICAL LAYOUT OF
REVERSIBLE ESCALATOR
OUTSIDE DRIVE
REFER TO DWG T-3070.

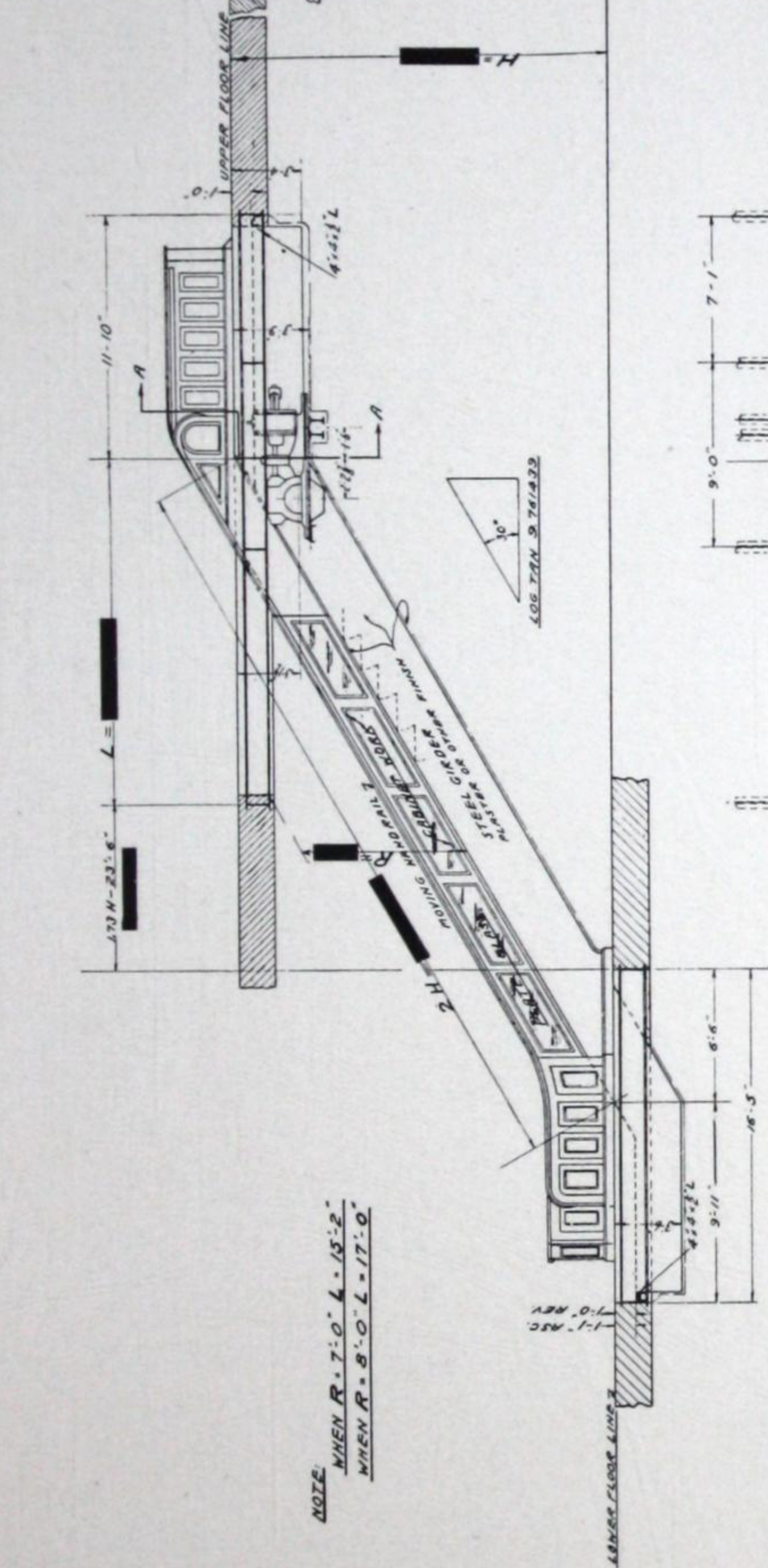
NOTE FOR LOWER LANDINGS
TRIANGULAR SHUNT SIMILAR TO THAT SHOWN FOR UPPER LANDING
MAY BE SUBSTITUTED FOR ONE-SIDED SHUNT IF DESIRED



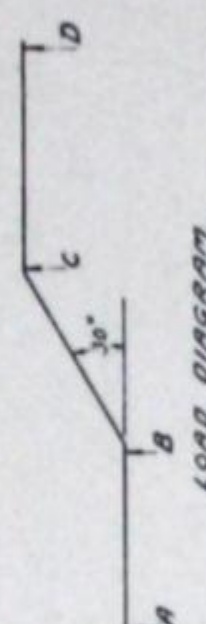
LANDS (A) (B) (C) FIGURES RE DISTRIBUTION ON
 CROSS BEAMS AND INCLUDES A USE ABOVE
 BEAMS AT POINT (C) TO BE RUN FROM FLOOR
 BEAMS OR SUPPORTED WOOD JOISTS
 IN-PIED OR BUTTRESS FROM FLOOR TO FLOOR
 IN FEET

LAND	THICK	WIDTH	WIDTH
(A)	1/2"	1/2"	1/2"
(B)	1/2"	1/2"	1/2"
(C)	1/2"	1/2"	1/2"

TYPE 10A ESCALATOR
 TYPICAL LAYOUT OF
REVERSIBLE ESCALATOR
 OUTSIDE DRIVE AND SHALLOW GIRDER CONSTRUCTION
 REFER TO ENDS TYPED



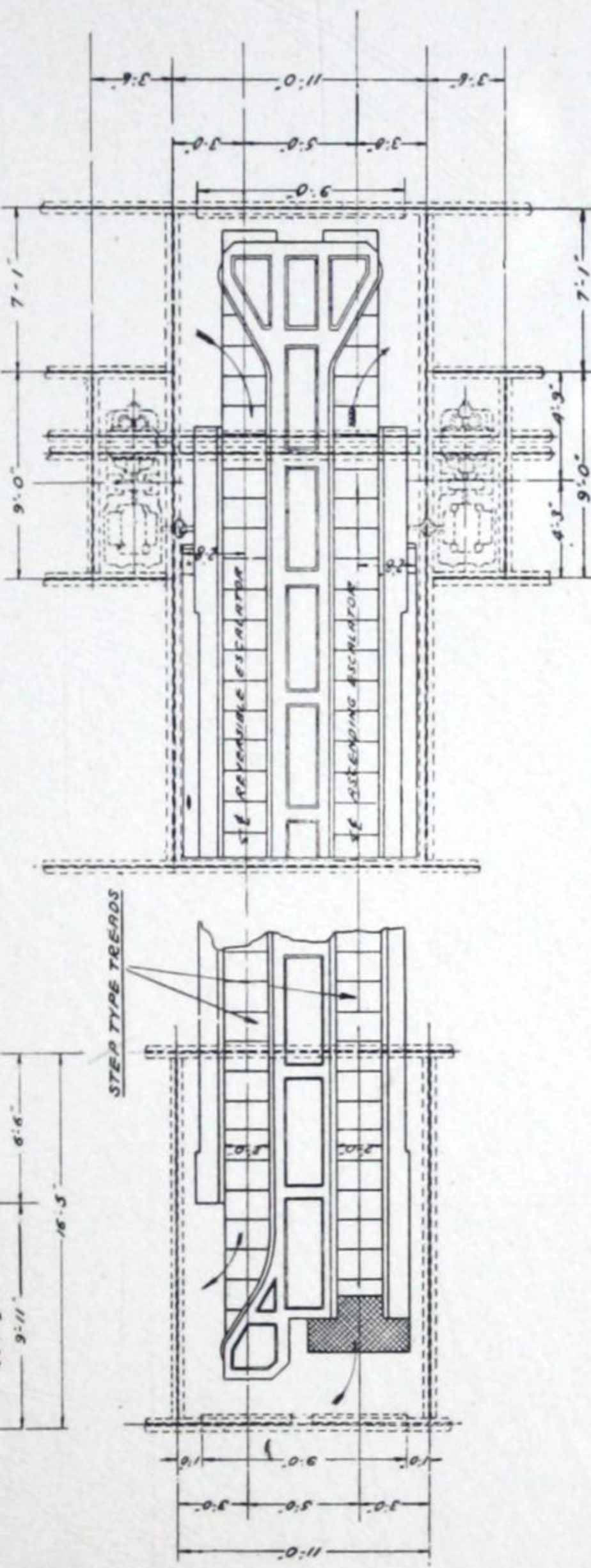
NOTE:
 $\text{WHEN } R = 7'0'' \text{ } L = 15'2''$
 $\text{WHEN } R = 8'0'' \text{ } L = 17'0''$



	LOADS
A	3200 #
B	960H + 3200 #
C	960H + 9800 #
D	7800 #

LOADS GIVEN IN TABLE ARE FOR TWO ESCALATORS
AND INCLUDE LIVE LOAD. ALL LOADS ARE
DISTRIBUTED ON CROSS BEAMS BETWEEN BEAMS
PARALLEL TO ESCALATORS.

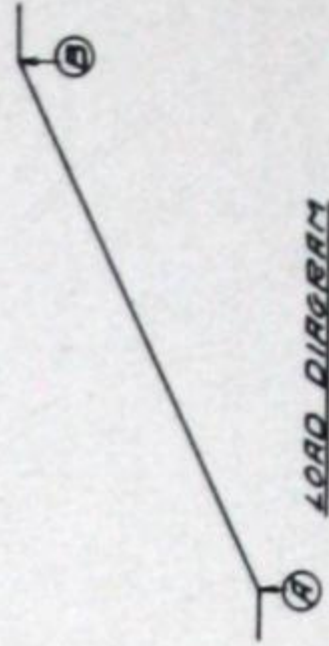
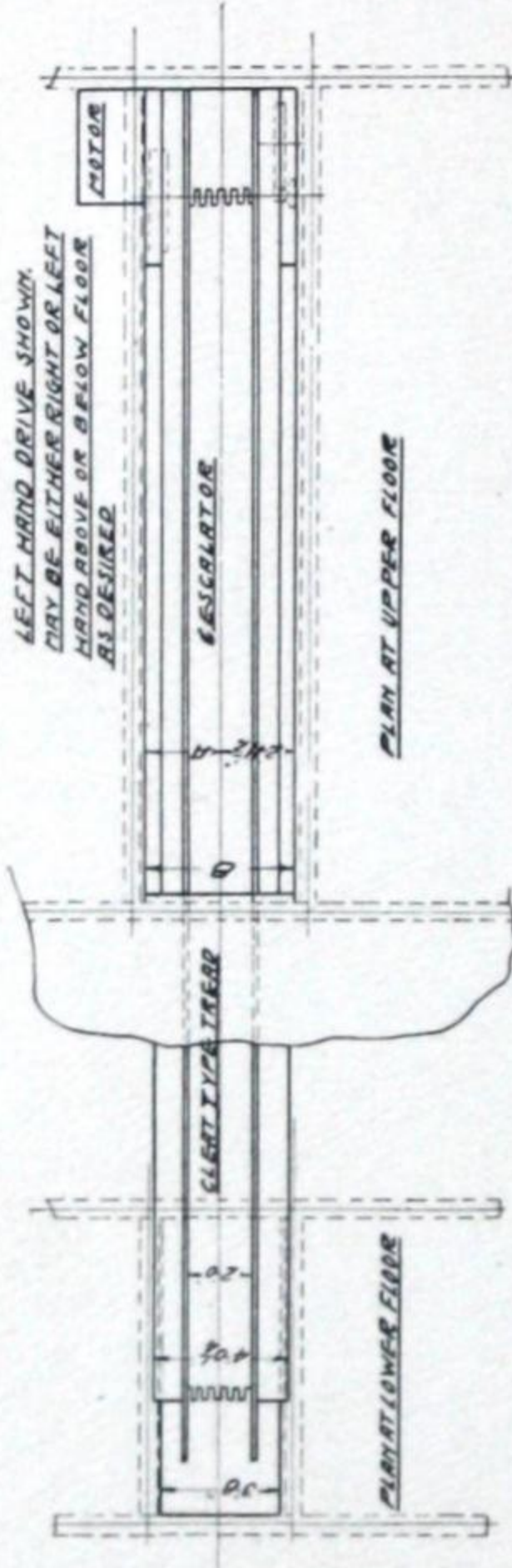
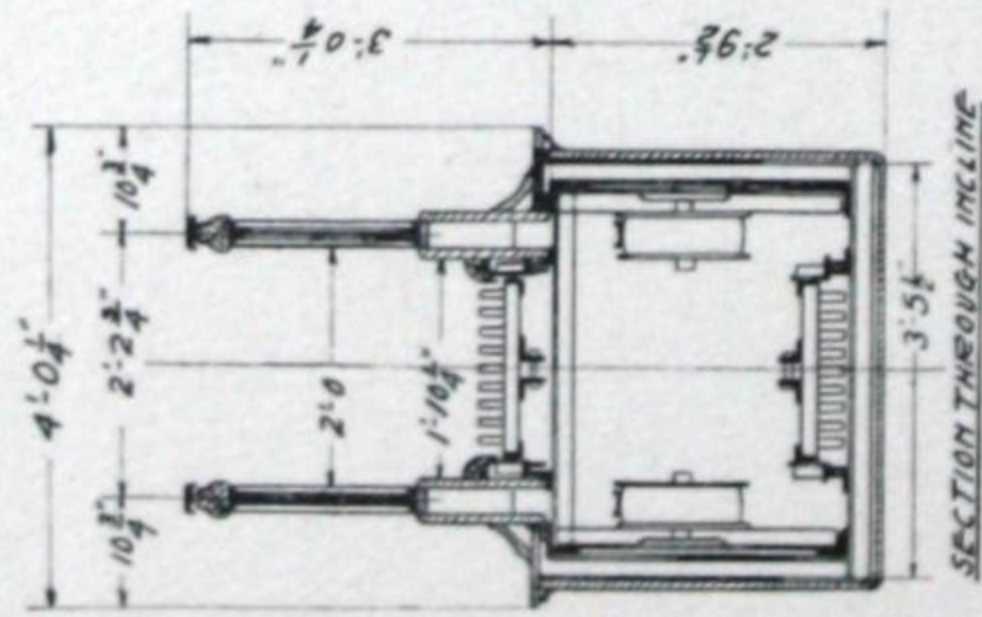
N - RISE OR DISTANCE FROM FLOOR TO FLOOR
IN FEET



PLAN AT LOWER FLOOR

PLAN AT UPPER FLOOR:

TYPE PE ESCALATOR
TYPICAL LAYOUT
ASC AND REV ESCALATORS
REFER TO DWG TRUSS

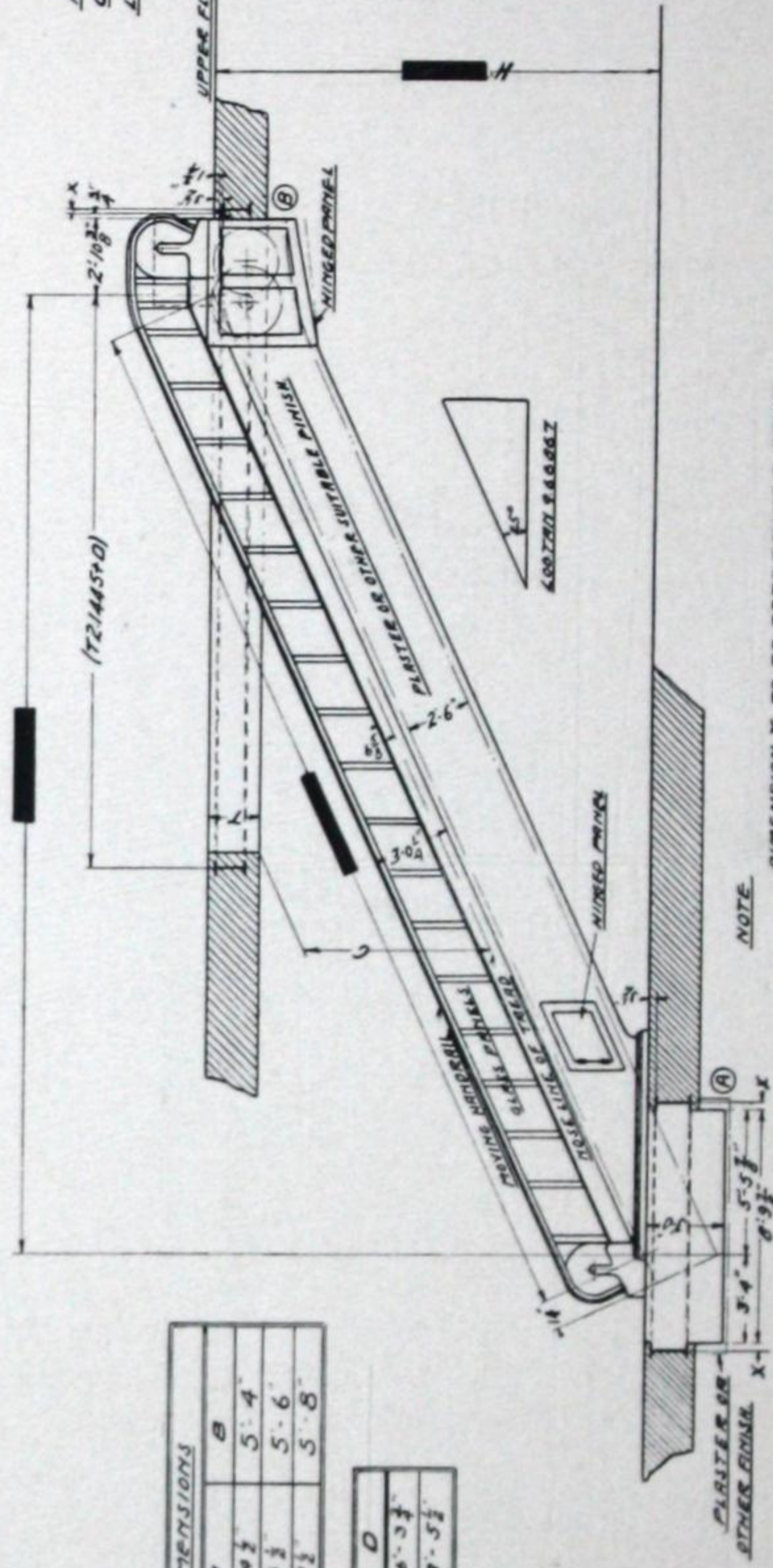


ALL LOADS FIGURED AS DISTRIBUTED ON CROSS BEAMS AND INCLUDE LINE LOAD.

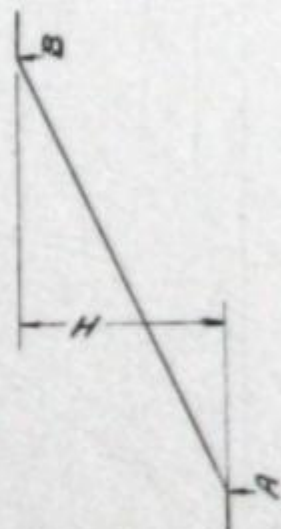
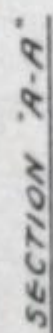
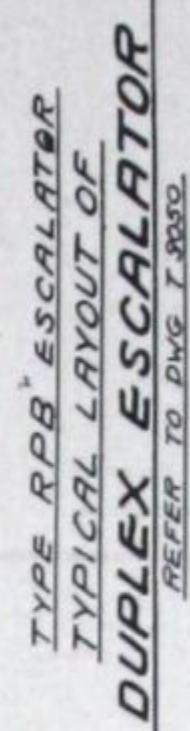
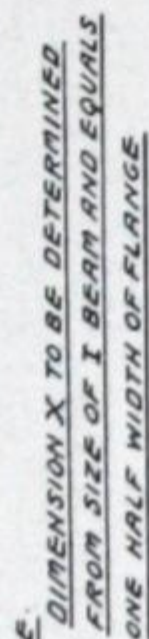
VARIABLE DIMENSIONS			
RISE	A	B	
UP TO 15'-0"	2'-4 1/2"	5'-4"	
16'-0" TO 25'-0"	2'-6 1/2"	5'-6"	
25'-0" AND OVER	2'-8 1/2"	5'-8"	

C	D
7'-0"	16'-3 1/2"
8'-0"	18'-5 1/2"

LOADS
 (A) $525H + 3400$
 (B) $525H + 2000$
 H: RISE OR DISTANCE FROM FLOOR TO FLOOR IN FEET
 T: DEPTH OF UPPER FLOOR IN FEET



TYPE RPC ESCALATOR
 SINGLE FILE
 REVERSIBLE ESCALATOR
 REFER TO PAGE 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100



LOAD DIAGRAM
ALL LOADS FIGURED AS DISTRIBUTED
ON CROSS BEAMS AND INCLUDE LIVE
LOAD.

<u>LOADS</u>	
A	$1000N + 6800''$
B	$1000N + 3000''$

H = RISE OR DISTANCE FROM FLOOR TO
FLOOR IN FEET.

T = DEPTH OF UPPER FLOOR IN FEET.

D	E
7'-0"	16'-5 1/4"
8'-0"	18'-7"

VARIABLE DIMENSIONS

NOTE: ARRANGEMENT OF ASCENDING AND DESCENDING SIDES MAY BE OPPOSITE HAND IF DESIRED

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Works: Harrison, N. J.
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St. Louis—Office: 300 Security Bldg.
Works: 8th and Mullanphy Sts.
Houston—Office and Works: German Street.
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BRANCHES—DOMESTIC

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Altoona, Pa.—1125 1/2 12th Ave.
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Baltimore, Md.—Equitable Bldg.
Birmingham, Ala.—426 S. 20th St.
Boston, Mass.—34-35 India St.
Buffalo, N. Y.—Franklin and Huron Streets.
Charleston, W. Va.—19 Hale St.
Charleston, S. C.—7 State Street.
Charlotte, N. C.—209 N. College Street.
Chattanooga, Tenn.—819 Cherry Street.
Cincinnati, Ohio—1014 Mercantile Library Building.
Cleveland, Ohio—701-707 St. Clair Avenue, N.E.
Columbus, Ohio—230 N. Third Street.
Dallas, Texas—Young and Akard Streets.
Denver, Col.—1626-1628 Glenarm Street.
Des Moines, Iowa—209 Crocker Building.
Detroit, Mich.—5th and Fort Sts.
Duluth, Minn.—109 2nd Ave., W.
Erie, Pa.—1509 Sassafras St.
Fort Worth, Texas—Cotton Exchange Building.
Grand Rapids, Mich.—40 S. Ionia Street.
Harrisburg, Pa.—4 N. Fifth St.
Harrison, N. J.—First St.
Hartford, Conn.—Courant Bldg.
Honolulu, Hawaii—Von Hamm, Young & Co., Ltd., Alexander Young Building.
Indianapolis, Ind.—101-107 Kentucky Avenue.
Jacksonville, Fla.—Buckman Bldg.
Kansas City, Mo.—1920 Wyandotte Street.
Knoxville, Tenn.—424 Wall St.
Little Rock, Ark.—219 W. 3d St.
Los Angeles, Cal.—218-220 East Fourth Street.
Louisville, Ky.—206 W. Main St.
Lynchburg, Va.—109 Eighth St.
Macon, Ga.—Commercial National Bank Building.
Memphis, Tenn.—Third Street and Madison Avenue.
Milwaukee, Wis.—115-117 Huron Street.
Minneapolis, Minn.—415 South Fourth Street.
Mobile, Ala.—270 North Royal St.
Moline, Ill.—120 17th Street.
Montgomery, Ala.—First National Bank Building.
Nashville, Tenn.—148 6th Ave., N.

New Haven, Conn.—82 Church Street.
New Orleans, La.—852 Carondelet Street.
Norfolk, Va.—65 Fayette Street.
Oklahoma City, Okla.—213 West First Street.
Omaha, Neb.—1214 Howard St.
Philadelphia, Pa.—12th and Sansom Streets.
Pittsburgh, Pa.—Keenan Bldg.
Portland, Me.—495 Fore Street.
Portland, Ore.—88 First Street.
Providence, R. I.—218-222 South Main Street.
Reading, Pa.—420 Chestnut St.
Richmond, Va.—12 S. Tenth St.
Rochester, N. Y.—Frank and Commercial Streets.
St. Paul, Minn.—10 Endicott Building.
Salt Lake City, Utah—Judge Building.
San Antonio, Tex.—104 Yturri St.
San Diego, Cal.—1103 G St.
Savannah, Ga.—Germania National Bank Building.
Scranton, Pa.—217 Spruce St.
Seattle, Wash.—26 West Connecticut Street.
Spokane, Wash.—821 Paulsen Building.
Springfield, Mass.—356 Main St.
Syracuse, N. Y.—374 W. Fayette Street.
Tampa, Fla.—209 Krouse Street.
Toledo, Ohio—522 Jackson Ave.
Trenton, N. J.—821 Carteret Ave.
Utica, N. Y.—114 Arcade Bldg.
Waco, Texas—Times-Herald Bldg.
Washington, D. C.—Metropolitan Bank Building.
Wheeling, W. Va.—1311 Jacob Street.
Wilmington, Del.—215 Ford Bldg.
Worcester, Mass.—Central Exchange Building.
Youngstown, Ohio—Federal Bldg.

CANADA

Otis-Fensom Elevator Co., Ltd.—Main Office: Traders Bank Building, Toronto, Ontario.
Works: Victoria Avenue, Hamilton, Ontario.

BRANCHES

Montreal, P. Q.—368 St. James Street.
Calgary, Alta.—322 Ninth Ave., W.
Ottawa, Ont.—9 O'Connor Street.
Vancouver, B. C.—157 Water St.
Winnipeg, Manitoba—316 Cumberland Avenue.
Victoria, B. C.—526 Chancery Lane Avenue.
Edmonton—562 Second Street.

FOREIGN

Otis Elevator Company, Ltd.—Main Office: 4 Queen Victoria Street, London, England.
Birmingham, Eng. (Branch Office)
Bradford, Eng. " "
Brighton, Eng. " "
Glasgow, Scotland " "
Liverpool, Eng. " "
Manchester, Eng. " "
Newcastle, Eng. " "
Otis Elevator Gesellschaft, M.B.H., Berlin, Germany—Koniggratzerstrasse, 97.
Factory: Berlin—Wittenau.
Budapest, Austria-Hungary—V. Vecseyutca 3.

Brussels, Belgium—Compagnie Belge des Ascenseurs Otis, Chaussee d'Anvers.
Antwerp, Belgium—Compagnie Belge des Ascenseurs Otis.
Ostend, Belgium—Compagnie Belge des Ascenseurs Otis.
Amsterdam, Holland—Fred Steltjes & Co., Keizirsgracht, No. 745.
Moscow, Russia—John Block Co.
Rustof D, Russia—John Block Company.
St. Petersburg, Russia—John Block Company.
Warsaw, Russia—Messrs. Chr Brun & Son, Agents.
Barcelona, Spain—Peninsula Engineering Co., Poate del Angelio
Madrid, Spain—S. Morris, Calle del Prado 10 Principal, Madrid.
Alexandria, Egypt—Egyptian Investment & Agency Co.
Cape Town, South Africa—R. M. Ross & Co., Strand Street.
Durban, South Africa—A. H. Johnson & Co., Ltd.
East London, South Africa—A. C. Maytham & Co., Hanover St.
Johannesburg, South Africa—A. H. Johnson & Co., Ltd., Adelaide Building.
Pt. Elizabeth, South Africa—A. H. Johnson & Co., Ltd.
Havana, Cuba—Sussdorff, Zaldo & Co., 36-38 O'Reilly Street.
Honolulu, Hawaii—Von Hamm, Young & Co., Ltd., Alexander Young Building.
Mexico City, Mexico—Enrique Schoendube, Apartado 756.
Newchwang, China—E. A. Sargent.
Shanghai, China—American Trading Company, 2 and 4 Hankow Road.
Tientsin, China—American Trading Company.
Calcutta, India—Martin & Co., 6 and 7 Clive Street.
Kobe, Japan—American Trading Company, No. 99.
Yokohama, Japan—American Trading Company, 28 Main St.
Bahia, Brazil—Guinle & Co., Rua Conselheiro Saraiva, 34.
Porto Alegre, Brazil—Lima & Martins, Caixa do Correio, No. 64, Estado do Rio Grande do Sul.
Rio de Janeiro, Brazil—Guinle & Co., Avenida Central, 107.
San Paulo, Brazil—Guinle & Co., Rua Deirerta, No. 7, P. O. Box Q.
Buenos Aires, Argentine—Buxton, Cassini & Co., Calle Suipacha Esq., Tucuman.
Rosario de Sante Fe—Buxton, Cassini & Company, San Lorenzo 1201, Esq. Mitre.
Santiago, Chile—Spencer & Waters, Casilla 627, or Pasaje Balma ceda No. 11.
Valparaiso, Chile—Spencer & Waters.
Australia—Main Office: George St., Sidney, J. B. Nicholson, Agent.
Adelaide, Australia. Branches.
Auckland, N. Z. " "
Christchurch, N. Z. " "
Dunedin, N. Z. " "
Melbourne, Australia " "
Perth, Australia " "
Wellington, N. Z. " "

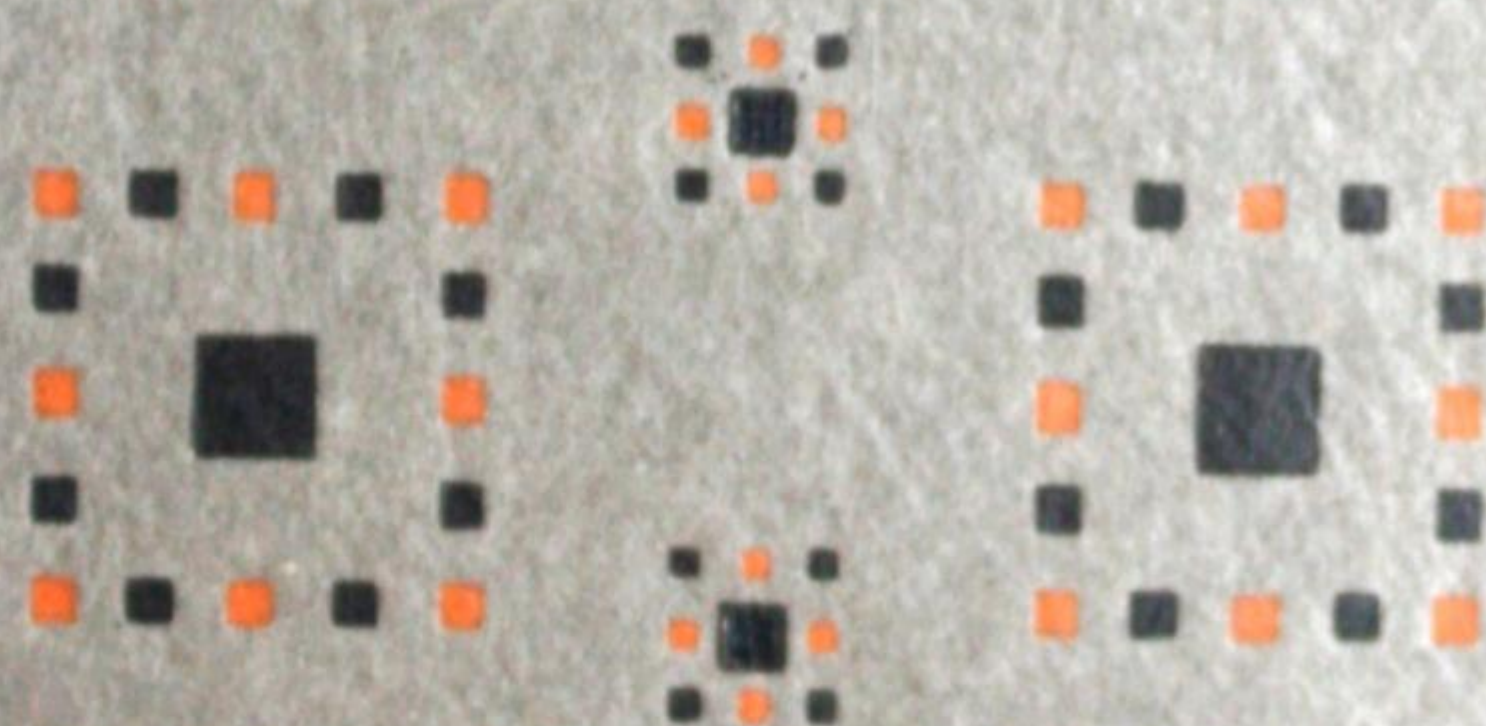




OTIS
ELEVATOR
COMPANY



INCLINE
RAILWAYS





OTIS INCLINE RAILWAYS



OTIS
ELEVATOR COMPANY

OFFICES IN ALL THE PRINCIPAL CITIES
OF THE WORLD

IN presenting this catalogue to engineers and others interested in Incline Railway hoisting, we desire to call attention to the fact that the widely varied and exacting duties which hoisting engines of this class are called upon to perform, prohibits illustrating in a work of this kind, machines that will meet the requirements of all conditions that may arise.

Our many years of successful experience in designing and manufacturing steam, hydraulic and electric hoisting machinery, places us in a position to solve any problem that may be encountered, whether it merely requires the modification of the standard types shown herein or the design of an entirely new type of apparatus.

INCLINE RAILWAYS

IT is the purpose of this catalogue to bring to the attention of those interested the many advantages of Incline Railways for developing and enhancing the value of property that otherwise would be practically of no value.

Very little in the way of literature can be found bearing upon this subject other than a few articles that have been published in engineering magazines concerning some particular installation.

In addition to pointing out the advantages, we will attempt to give a brief description of the most prominent Incline Railways installed by the Otis Elevator Company.

Incline Railways may be divided into three classes, namely:

- Tourist and Passenger Inclines.
- Traffic Inclines.
- Commercial Inclines.

The Tourist or Passenger Incline Railways are used as a means of reaching some high point on a mountain or in a mountain range, where the view of the surrounding scenery is particularly attractive. Usually at the upper terminus of the Incline Railway a hotel or summer colony is established, and the adjacent land, because of the Incline Railway, is converted from almost valueless property into an attractive, popular and profitable mountain resort.

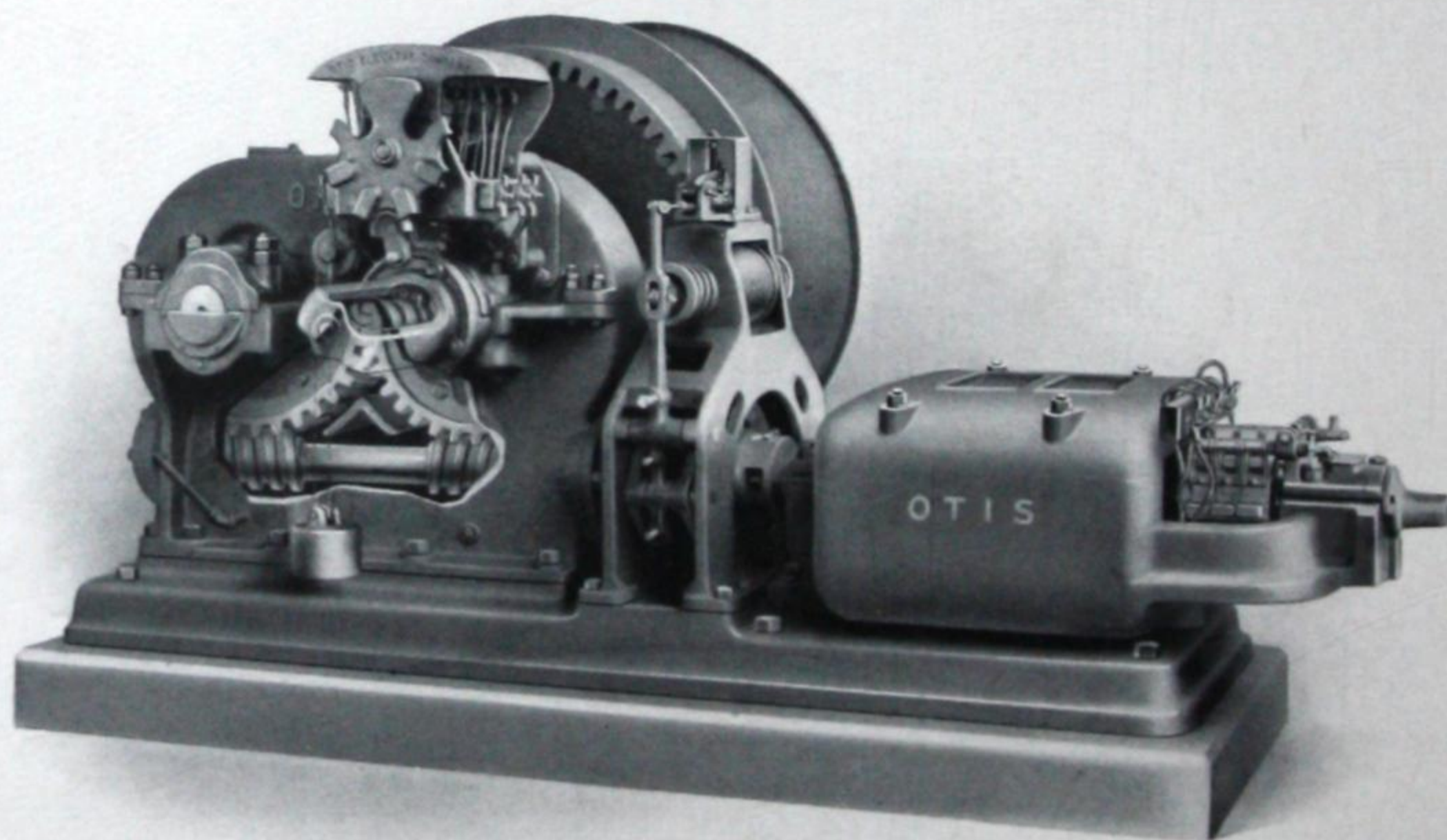
These Incline Railways, in the majority of cases where hotels have been erected or summer colonies established, have proven to be very profitable investments. This quick and comfortable means of transportation also results in developing the land on the mountain side for residential purposes, bringing large returns from its sale. There are, moreover, other conditions that make the Incline Railway an attractive investment for the purchaser. There are large tracts of land throughout the country that are practically of no value, their elevation making them inaccessible. These tracts of land, especially if in close proximity to a city, or even within the city itself, could be made extremely desirable and valuable for residential purposes if there were some easy means of approach. The Incline Railway provides the means of developing such tracts of land and makes them accessible and valuable.

TRAFFIC INCLINES

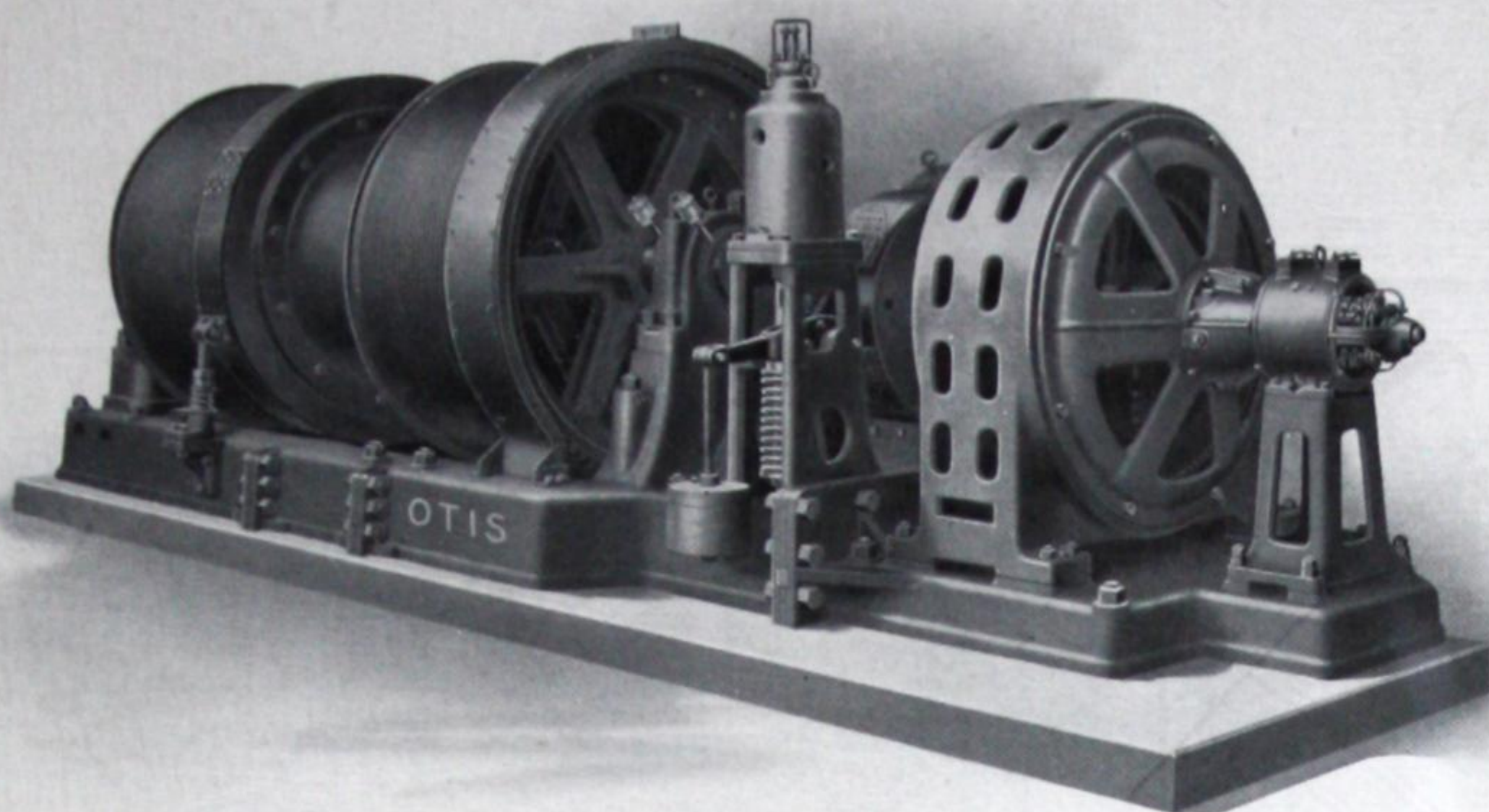
Many of our cities are so situated, due to the topography of their location, that the walking public and teaming traffic are seriously handicapped in travelling from one part of the city to another, because of the many steep grades.

A great many of the grades are so steep that general use even for pedestrians is prohibitive, and enormous sums of money are expended to build long winding roads or viaducts of easy grades to overcome this difficulty. The distance travelled and time consumed, however, is a serious objection, often resulting in retarding the development of that particular section. In a great many cities Traffic Incline Railways have been installed to meet this condition.

These Inclines, where installed and operated either by cities or private capital, whether easy grade approaches are provided or not, have proven to be excellent investments, and at the same time are of great assistance and convenience to the public that they serve. They may be located at a point to suit best the traffic conditions.



Typical Drum Type of Machine used for short
Inclines and medium loads.



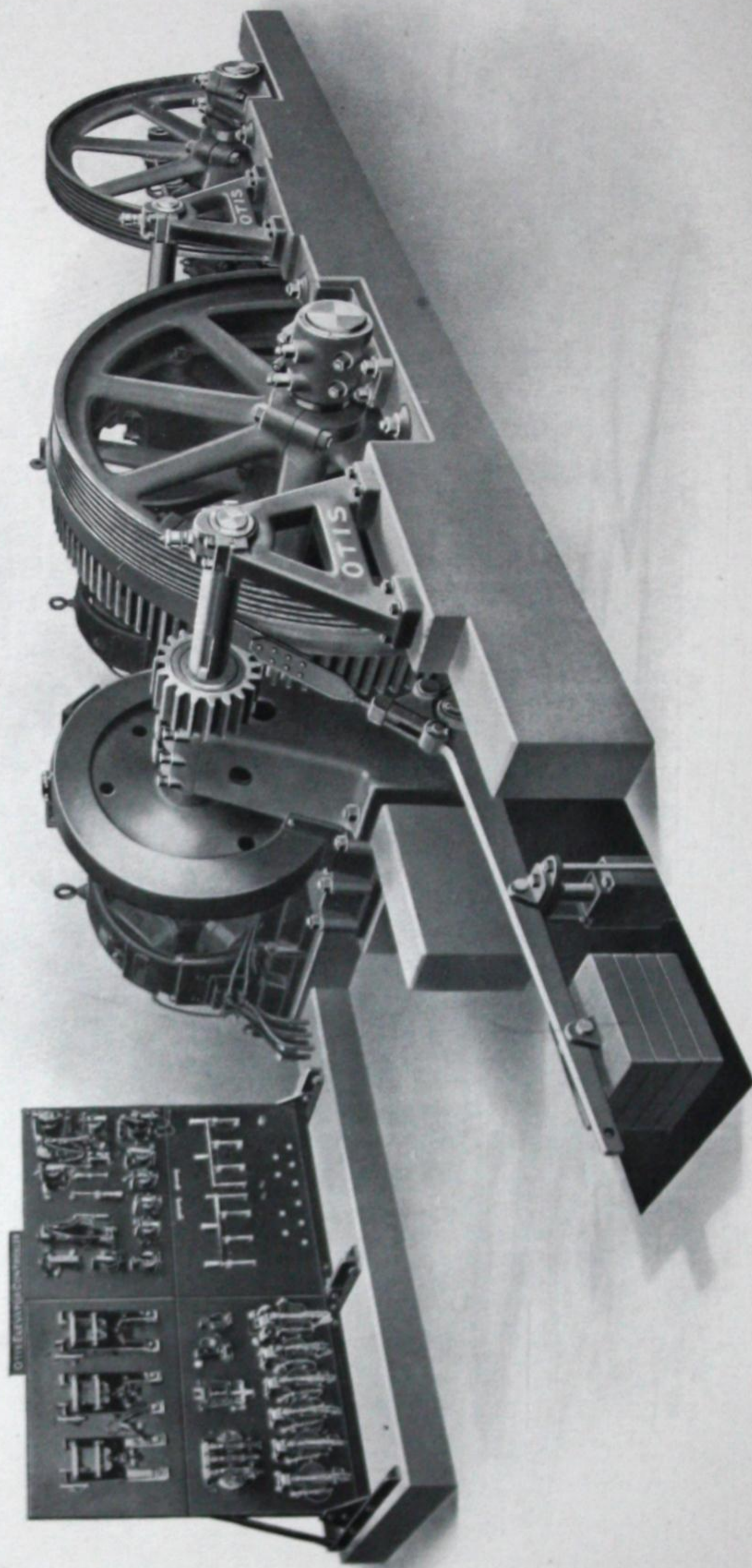
Typical Spur Geared Type of Hoist used for handling heavy loads on short Inclines or where the length of travel permits the use of the Drum Type of machine.

The rapid development and perfection of electric-driven hoisting machinery with automatic controlling devices for the safe operation of such machinery, opens up a new and greater field for this method of transportation.

COMMERCIAL INCLINES

In the above class we include Incline Hoisting outfits used in industrial enterprises for various purposes, such as hoisting stone in quarries or cement plants to be dumped into crushers or cars; hoisting of ore, coke and limestone in blast furnaces, roasting furnaces or coke plants, and for transferring baggage and freight from a lower to an upper level where sections of adjoining railroads are on different levels. The possible and practical application of this class of Incline Hoisting is almost unlimited.

The successful and safe operation of the many installations furnished by this company has been made possible by the Otis automatic controlling and safety devices, in addition to the efficient work of designing by our expert engineers employed on this class of work, and the high standard of our apparatus. Each individual case is carefully studied by our engineers, apparatus is selected to



Typical Spur Geared Hoisting Machine as used for Incline Railways of great length requiring the traction type of drive.

suit the purpose most satisfactorily and changes in conditions are suggested, if feasible, to increase the efficiency of the outfit.

The ideal Incline Railway equipment consists of two cars arranged to run in opposite directions on a single track with the Brown Patent Turnout midway on the incline and the roadbed so graded that no matter what the distance travelled (with equal load on the cars) the outfit will be at all times in balance, operated by full automatic controlling and safety devices and (if used for passenger service) equipped with safety devices adjusted to stop and hold the cars from excessive speed due to breaking of cables or other causes.

The Drum types of Machines are used for Inclines where the distance is comparatively short, but in no case should the rope be permitted to overwind on the drums. In case the distance is too great to permit of the use of the drum machine, the traction type is used, the hoisting ropes passing over a traction driving and idler sheave, and the number of turns depending on the traction required.

On the following pages are illustrated a few of the most important Incline Railways installed by this company, with a brief description of each. We will furnish, upon application, necessary information and estimates with sketches for this class of work. We invite correspondence with those who contemplate the installation of Incline Railways for any purpose, whether the high class Tourist and Passenger Incline or the plain, substantial Incline as used for handling material in stone quarries, blast furnaces, etc.

We are in a position to furnish expert advice and will be pleased to co-operate with those interested and their engineers; or we will furnish engineers to act in a consulting capacity to successfully work out problems pertaining to this class of work. It is important that all possible data be furnished us for contemplated Inclines and blank data sheets for this purpose will be furnished upon application.



INCLINE RAILWAY

PARK HILL, NEW YORK

This Incline was installed in 1894.

The total travel of the car is about 162 feet, and the vertical distance approximately 107 feet.

The angle of the track is 40 degrees from the horizontal.

The car is 5 feet 9 inches x 6 feet, carrying ten people at a speed of 165 feet per minute, and is equipped with safety devices. It is operated by an Otis Hydraulic Machine of the horizontal type.

The machine is located underneath the tracks near the top landing.

The object of this Incline was to develop and enhance the value of the land for residential uses, and it has accomplished this purpose with excellent results.

INCLINE RAILWAY

CATSKILL MOUNTAIN, CATSKILL, N. Y.

The construction of the Catskill Mountain Incline Railway was commenced in the latter part of January, 1892, and the road was opened for service on August 4th, of that year.

The total length of the road is 7000 feet, and the vertical rise 1630 feet. Maximum grade, 34 per cent.; average grade, 23 per cent.; gauge of track, 3 feet.

The road is of the three-rail type, the middle rail being common to the two tracks. There are two cars fixed to the cable ends, one of them making a down trip while the other is making the up trip. The cars pass each other midway on the line, where a fourth rail is introduced for a distance of about 200 feet.

Each train consists of one passenger and one baggage car. The passenger cars have a clear length of 46 feet, and are 7 feet 6 inches wide. They seat comfortably 75 passengers, though a maximum of 90 can be attained. The baggage cars are open, being simply platforms with sides, but no tops.

The cars run at a speed of about 700 feet per minute, or 8 miles an hour, and the trip is made in about 10 minutes.

The hoisting machinery is operated by Otis engines located at the top of the mountain.

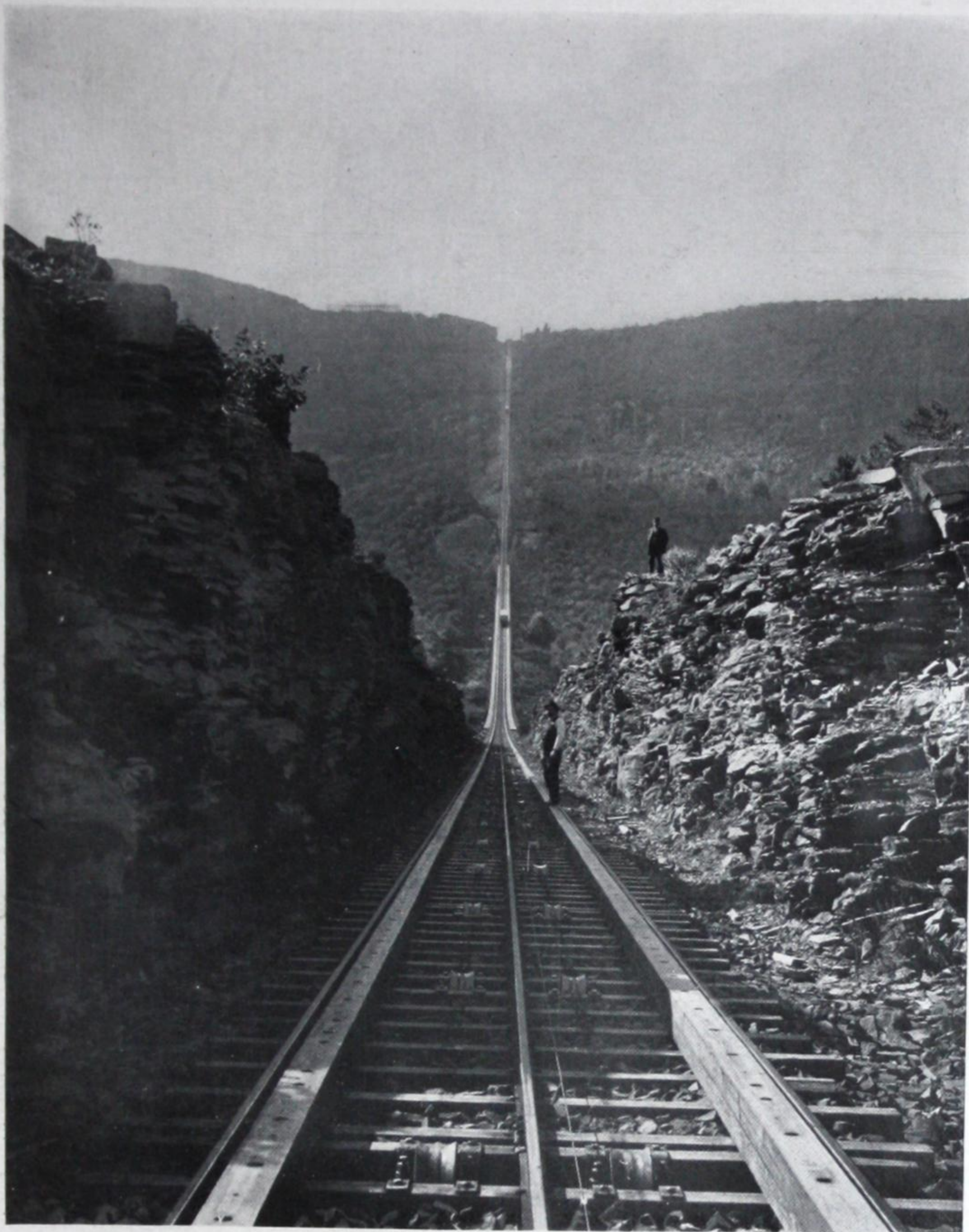
Each of the two cables is 7,250 feet long, and weighs about ten tons.

The cars are provided with a safety device which is entirely independent of the ordinary brakes on the car and has three serrated gripping surfaces, one of which forms part of a pivoted dog. This dog is acted upon by a special speed governor. When in action the dog sinks its teeth into one side of the wooden guard rail placed between each outer and middle line of rails, and thereby draws the other serrated surface against the other side and the top of the guard rail. The clutch then grips the guard rail on three sides and has a holding power of about 30,000 pounds.



The road operates trains in connection with the regular trains on the Catskill Mountain Railway and the steamboat lines on the Hudson River. Its upper terminus is within a few rods of the Catskill Mountain House, and from it some of the most popular summer resorts of the mountains can be reached by drives or by the Catskill and Tannersville Railroad.

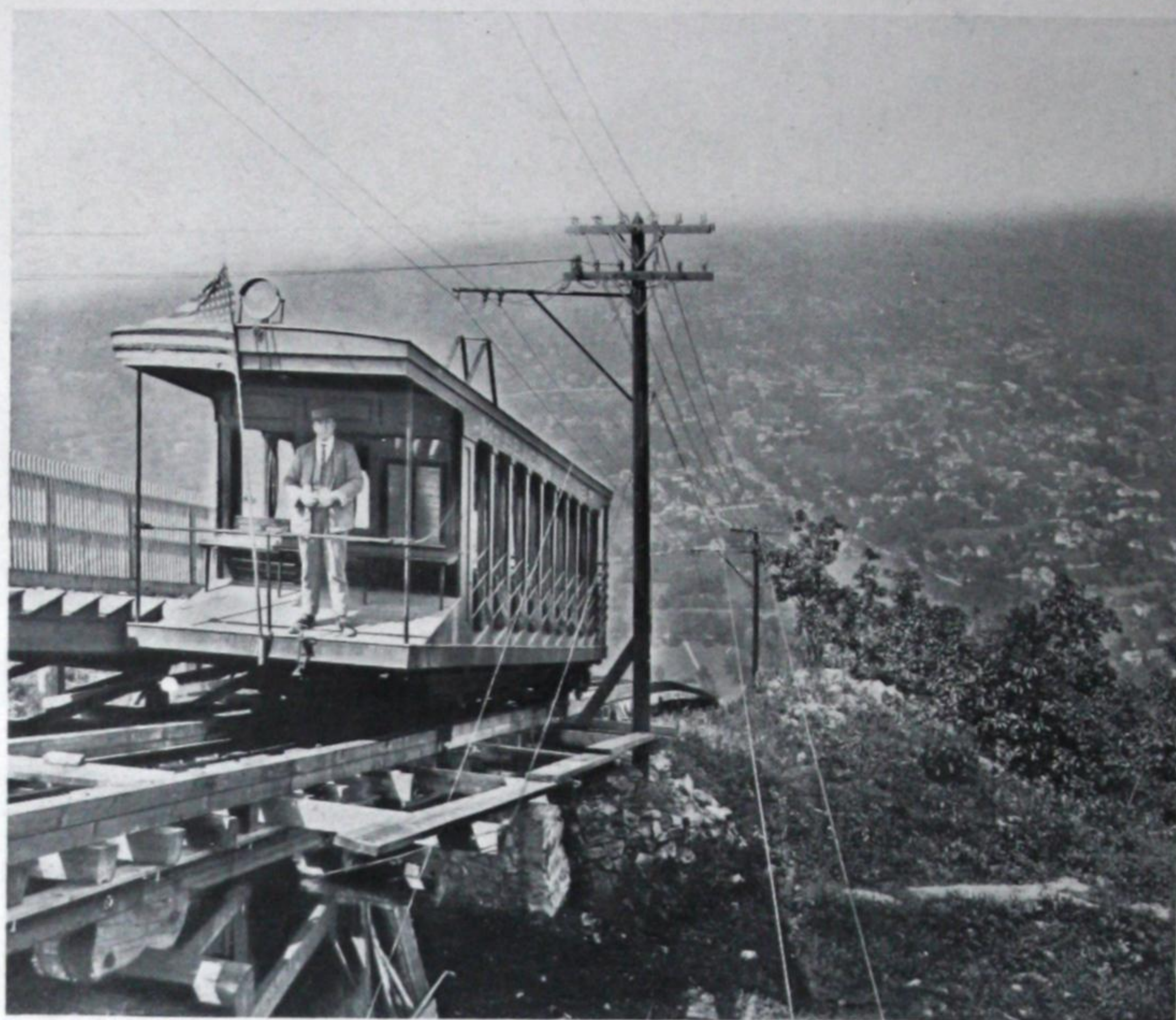
Each of the engines in the power house is fitted with a strap brake, applied from the operating room above by a lever. The main hoisting drum, which is



geared to the engines, is also fitted with a strap brake.

The terminal stations and the cars are connected by telephone and electric gong signals.

Incline Railway installations of this character call for a very careful and expert study of the topography of the site contemplated for the roadbed, because the grades, horizontal curvatures and other conditions directly affect the costs of cutting and filling and the efficiency of the Incline in its power consumption.



INCLINE RAILWAY

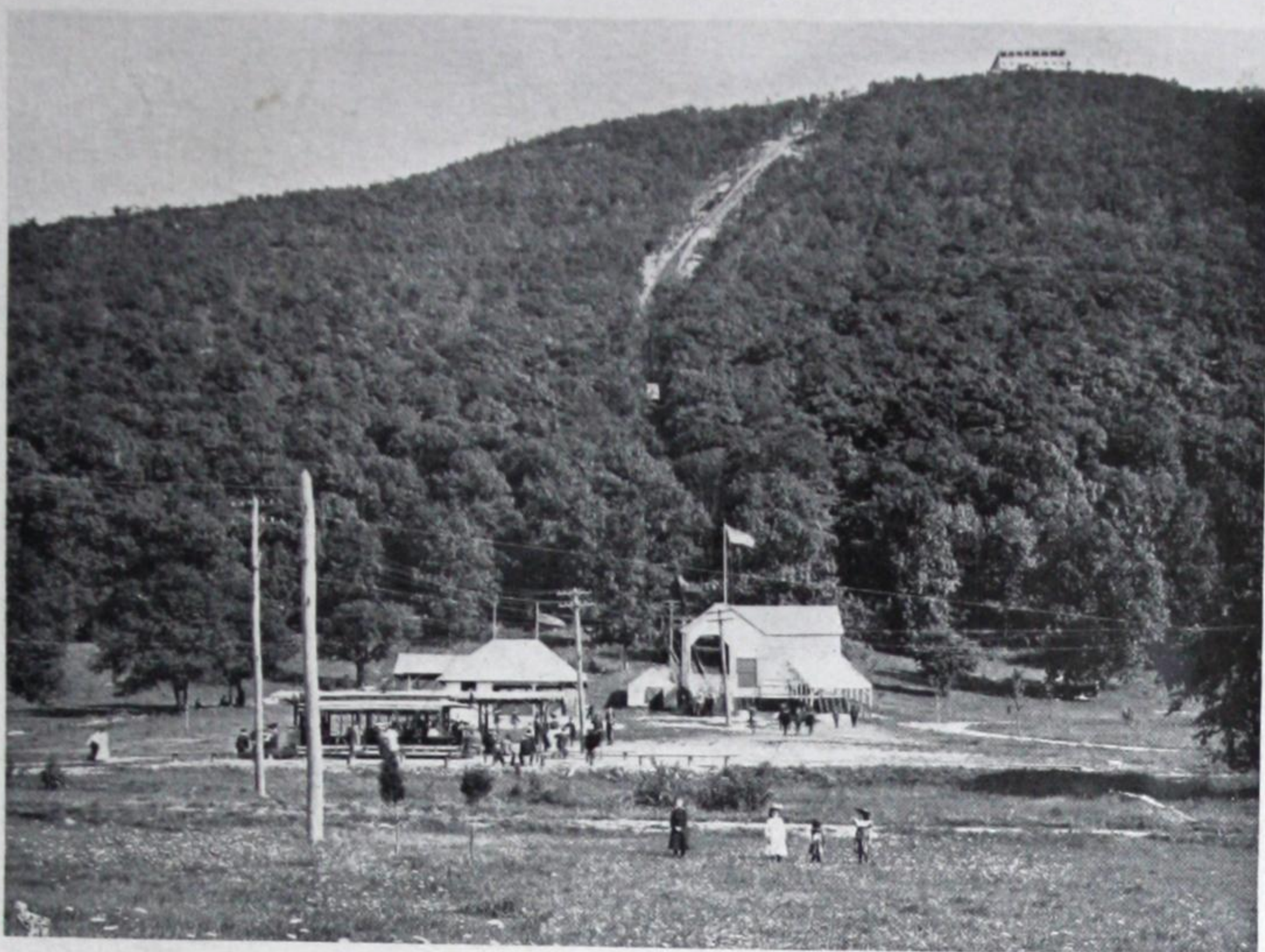
BEACON MOUNTAIN, FISHKILL, N. Y.

This Incline is located on and ascends the steep face of North Beacon, Fishkill Mountains, and was opened May 30, 1902. Revolutionary memories have made the mountain famous, for on its top and on that of its twin, the South Beacon, burned the signal fires which gave warning of approaching danger to the surrounding country and the valley of the Hudson River.

The Incline extends from the base to the top of the mountain, a distance of 2,200 feet, rising in places at the rate of 68 feet in a hundred feet of length.

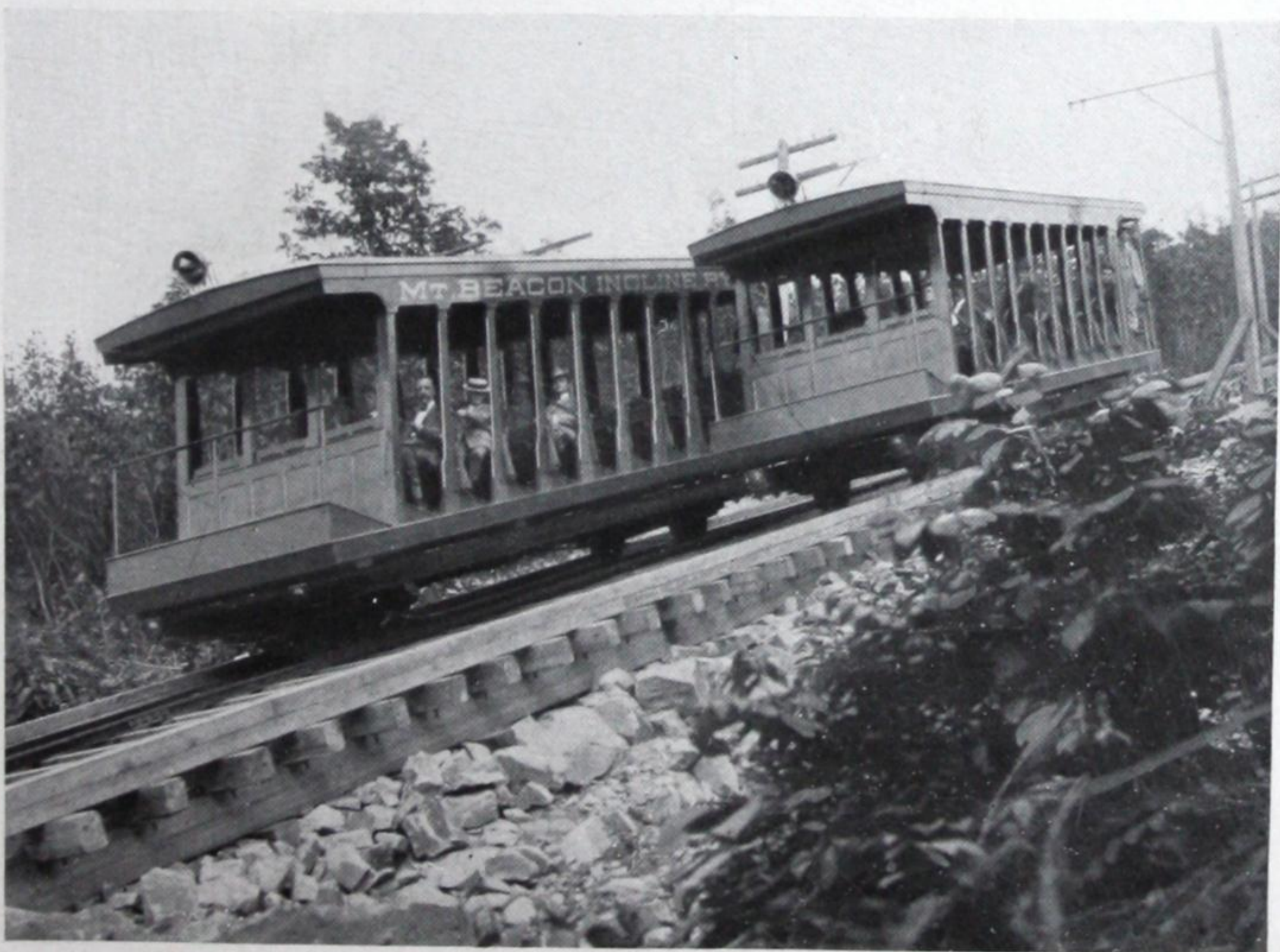
There are two cars, each about 34 feet long, with a carrying capacity of 60 passengers. This road is equipped with Brown Patent Turn-out, and apparatus previously described.

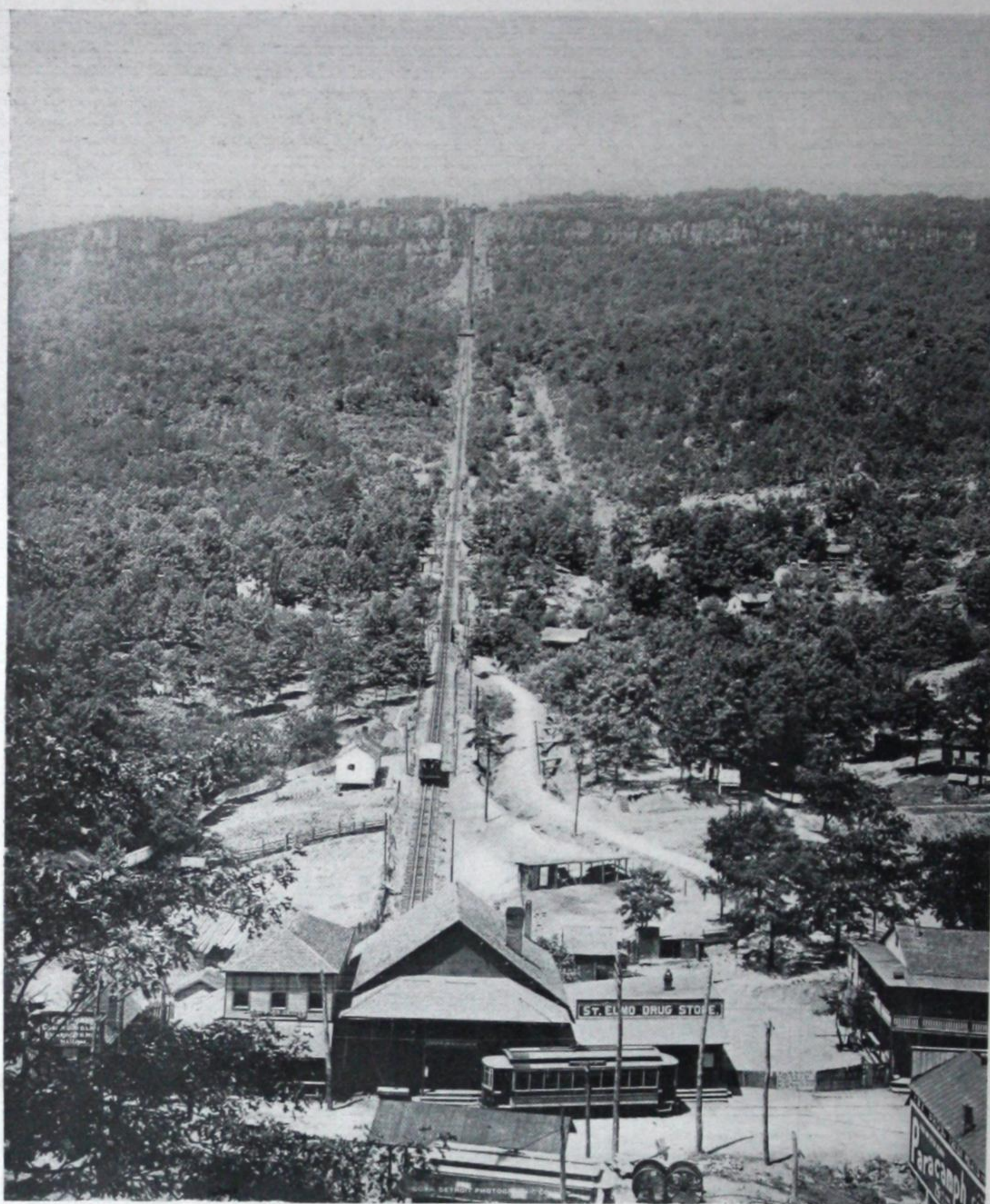
A hotel, casino and bungalows are located on top of this mountain, and the easy and comfortable means of approach has resulted in making this resort very popular.



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The cut above shows a general view of Beacon Mountain with the Mt. Beacon Hotel at the peak. Below are seen two cars passing each other at the turnout.





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INCLINE RAILWAY

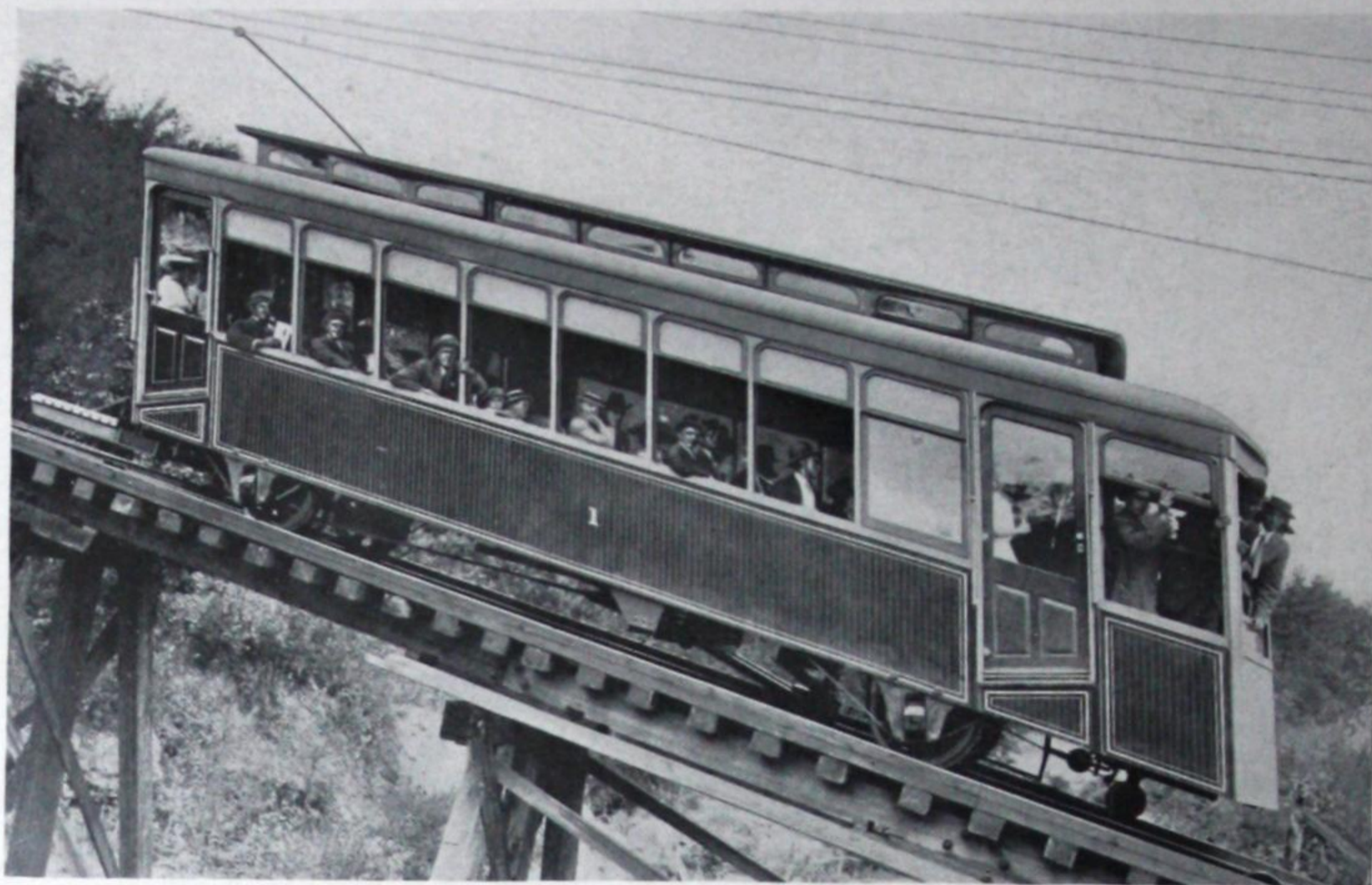
LOOKOUT MOUNTAIN, CHATTANOOGA, TENN.

Lookout Mountain is famous the world over for its beautiful view from Point Lookout and the "Battle above the Clouds," fought during the Civil War. The top of the mountain is reached by an Incline Railway which was originally operated by steam, and recently reconstructed by the Otis Elevator Company, with electric hoisting equipment of the latest and most improved design.



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The road runs from St. Elmo, at the base of the mountain, to the top, a distance of 4,750 feet, with intermediate stations, the vertical height from the lower to the upper terminal being 1500 feet. The average grade is about 35 per cent., and the maximum grade is reached at a point near the top where it is about 67 per cent. The trip up or down is made in eight minutes, and each car has a carrying capacity of 45 persons, in addition to freight. The road-bed consists of a single track system from the lower terminal to a point half-way up the incline, where the turnout is located to permit the cars to



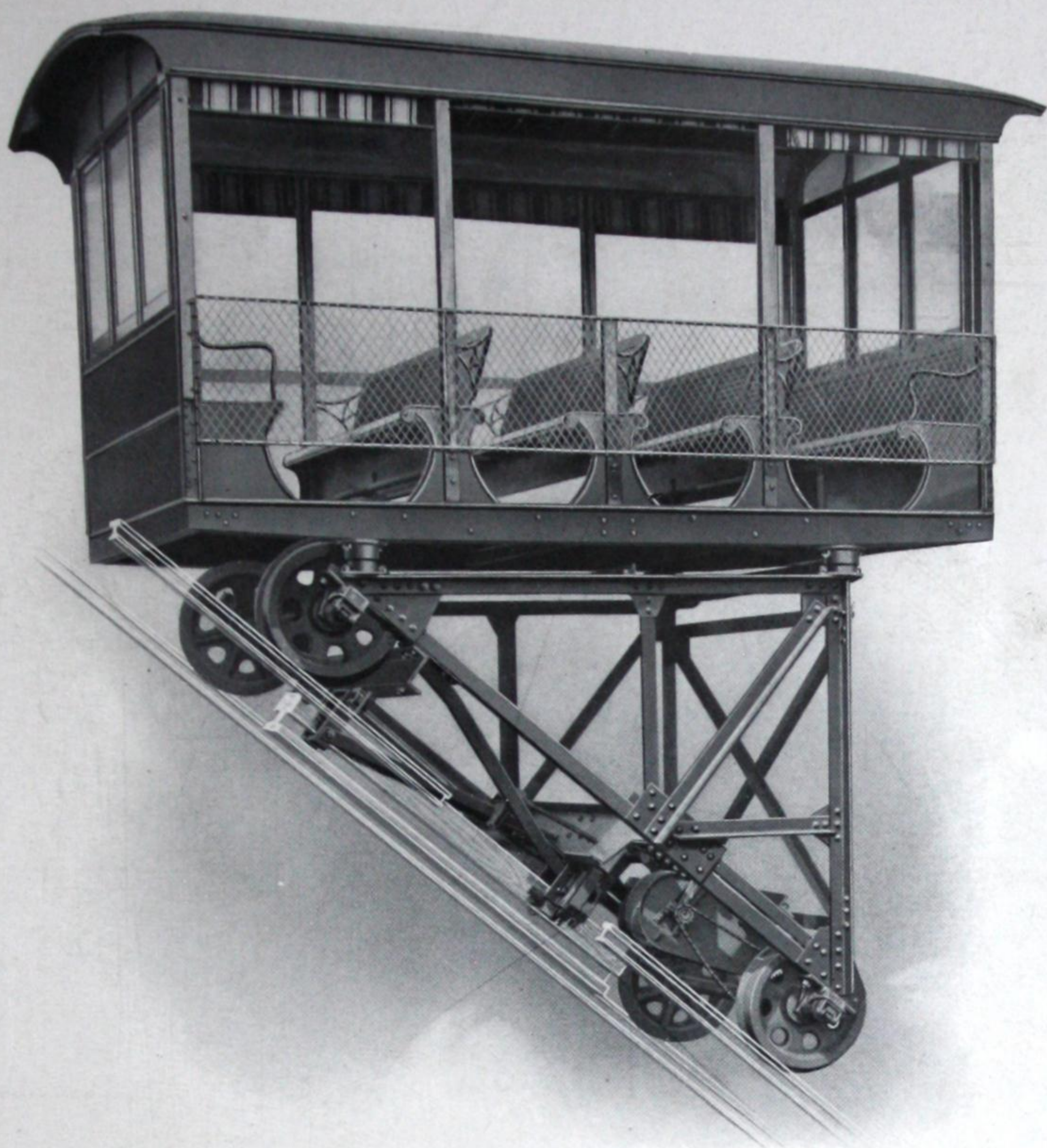
pass each other; from that point to the top a three-rail road is used, the middle rail being common for both cars.

The arrangement of tracks at the turnout is such that the cars automatically take their proper course without the use of switches. The Hoisting Machine is of the traction type, and is driven by two electric motors of 130 horse-power each, either motor being capable of maintaining schedule should one motor become disabled.

Each car is equipped with the Otis *double grip* safety device, capable of holding 50,000 pounds. This device is automatically operated by a centrifugal governor, should an excessive speed be attained from any cause. Each safety is also provided with a hand operating device, by means of which it may be operated at any time by the attendant in charge of the car.

An additional safety feature, termed an Emergency Brake, is provided to engage the traction driving sheave on the machine, and is operated automatically by a centrifugal governor should the Hoist reach a pre-determined speed above normal. It may also be operated at will by the operator whose station is at the head of the incline, from which point he controls the movement of the cars.

The Incline is also provided with Otis Electric Track Limit Switches which are operated by the cars and so arranged that cars are automatically and gradually



Typical Passenger Car used for short, steep inclines

brought to a stop at the upper and lower terminal. The action is entirely independent of the operator.

A suitable signalling system is provided as a means of communication between the cars and the operator. A positive indicator is located at the head of the Incline in full view of the operator, and is illuminated at night, enabling the operator at all times to note the position of the cars. This is essential on account of the intermediate stations. The dense fogs which prevail on the mountain side render such an indicator extremely important, as the cars are often completely hidden from the view of the operator.



INCLINE RAILWAY

UNCANOONUC MOUNTAIN, MANCHESTER, N. H.

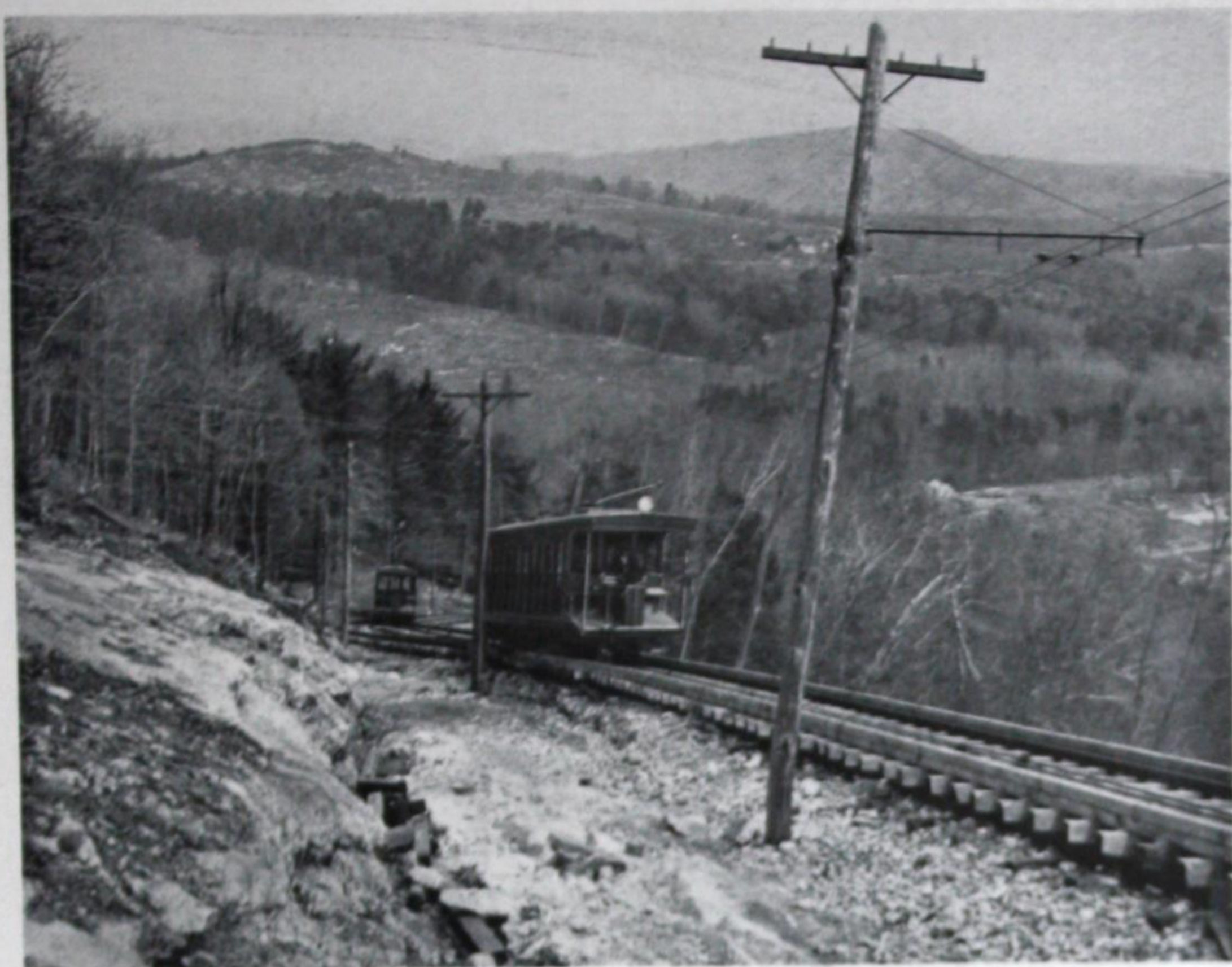
This road is operated by an overhead trolley system, and is equipped with Brown Patent Turnout, safety devices and signals, as furnished on our other installations, and was opened to the public in May, 1907.

There are two cars, carrying 60 people each.

The road is 2700 feet long, and rises to an altitude of 650 feet, with a maximum grade of $31\frac{1}{2}$ per cent.

The installation of this road has resulted in the development of the property on the mountain side, and a summer colony has been established at the upper terminus, including a hotel and places of amusement.

Intermediate stations are located at points along the line to accommodate those who have established homes on the mountain side. One of these stations, with car



ready to discharge or receive passengers, is shown in the illustration on the opposite page.



BAHIA INCLINE

CITY OF BAHIA

BRAZIL, SOUTH AMERICA

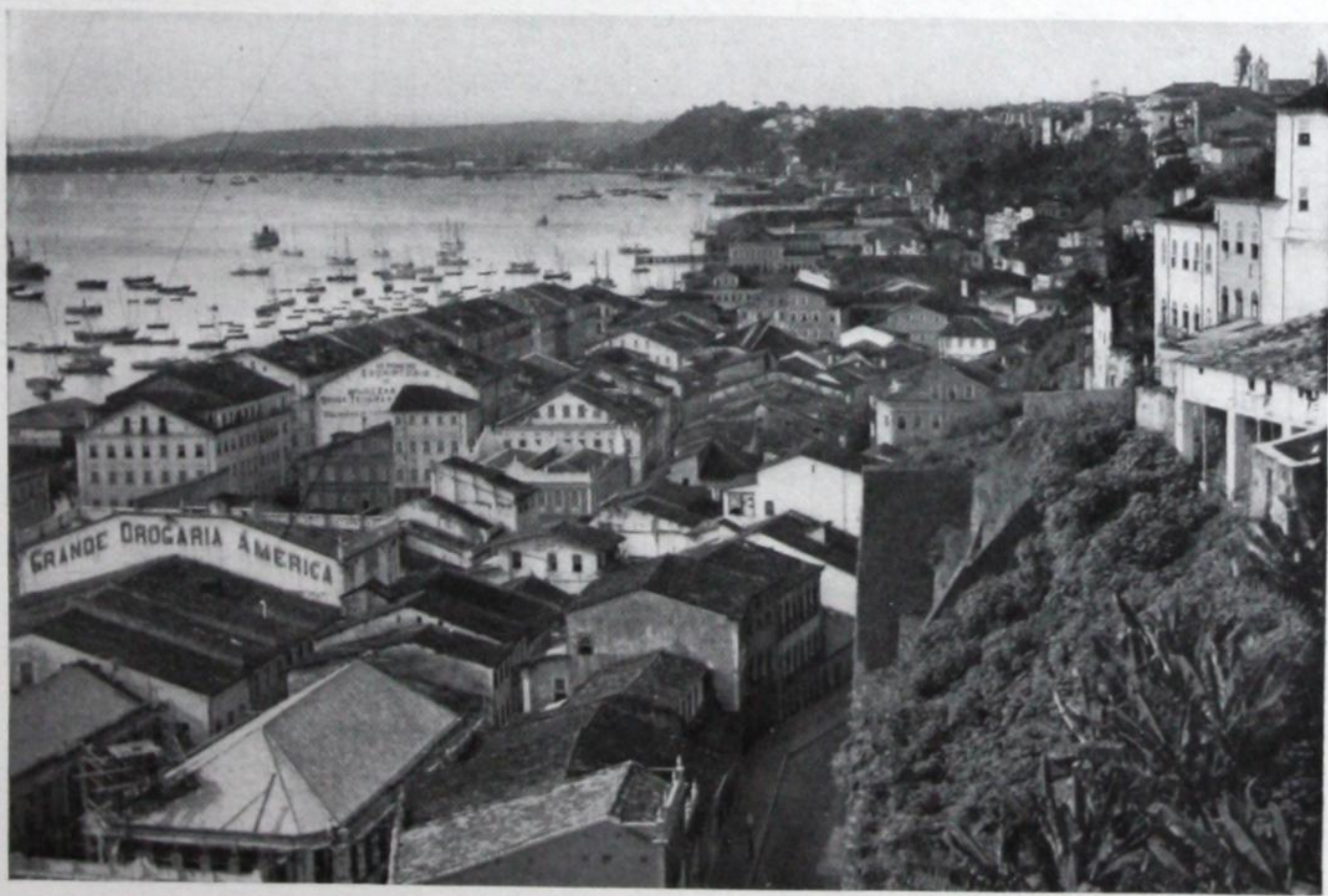
The city of Bahia is the capital of the State of Bahia, Republic of Brazil, South America. It is a city of about 240,000 inhabitants and is topographically peculiar in that a short distance back from the waterfront a cliff rises abruptly, and a portion of the city is located on the top of this bluff. It is thus divided into an Upper and a Lower City. All of the wholesale business is located in the Lower City, and a part of the retail business as well. The balance of the retail business and the residence sections are located in the Upper City; consequently there is much traveling back and forth.

To meet the city's requirements the Otis Elevator Company has already installed four electric elevators in two large vertical towers for providing ready means of communication between the Upper and Lower Cities. To supplement this service, an Otis Incline Railway has been installed which travels in a selected portion of the cliff, at an angle of about 40 degrees from the horizontal, making a trip up or down in one and a half minutes.

This Incline Railway consists of two balanced cars, each car capable of carrying about 20 people and a freight load of 1500 pounds, one car travelling up as the other car travels down.

The electrical machinery for operating the Incline is located in the head-house at the upper level, and electric switch control is applied together with the carefully worked out Otis safety devices for the machine and for the cars.

As Bahia is in the Torrid Zone, no devices for heating the cars are necessary, but proper provision is made for protecting the passengers or freight from the elements. The accompanying photographs convey some idea of the topographical arrangement of the city and of the Incline equipped and installed by the Otis Elevator Company.





INCLINE RAILWAY

WEEHAWKEN, N. J.

An Incline Railway which was constructed up the face of the Palisades, at Weehawken, N. J., for the transportation of trucks to the top of the hill, was opened for traffic about April, 1900. Prior to that time, teamsters and others, in order to reach the top of the cliffs at that point, were compelled to take a long, circuitous route, which meant a tedious climb and a loss of over an hour in time.

Many of the vehicles were weighted down with unusually heavy loads, making it extremely difficult for the horses to ascend the steep grade and resulting in their frequently becoming stalled. In such cases, it was of course necessary to take part of the load from the wagon.

To avoid this, a Traffic Incline Road was constructed up the face of the cliffs for the transportation of trucks and other vehicles.

The road runs from the base of the Palisades in a direct line to the summit.



The distance is only 290 feet, yet the grade rises to a height of 72 feet in each 100. From a distance the road looks as if it were perpendicular. Two large cars of massive steel construction are run in balance and accommodate several heavily laden trucks at a time. This installation is probably one of the most profitable Traffic Inclines in use to-day. An Otis Incline Railway Hoisting Engine of special design is used to operate these cars, controlled by an Otis Full Magnet Controlling Device.

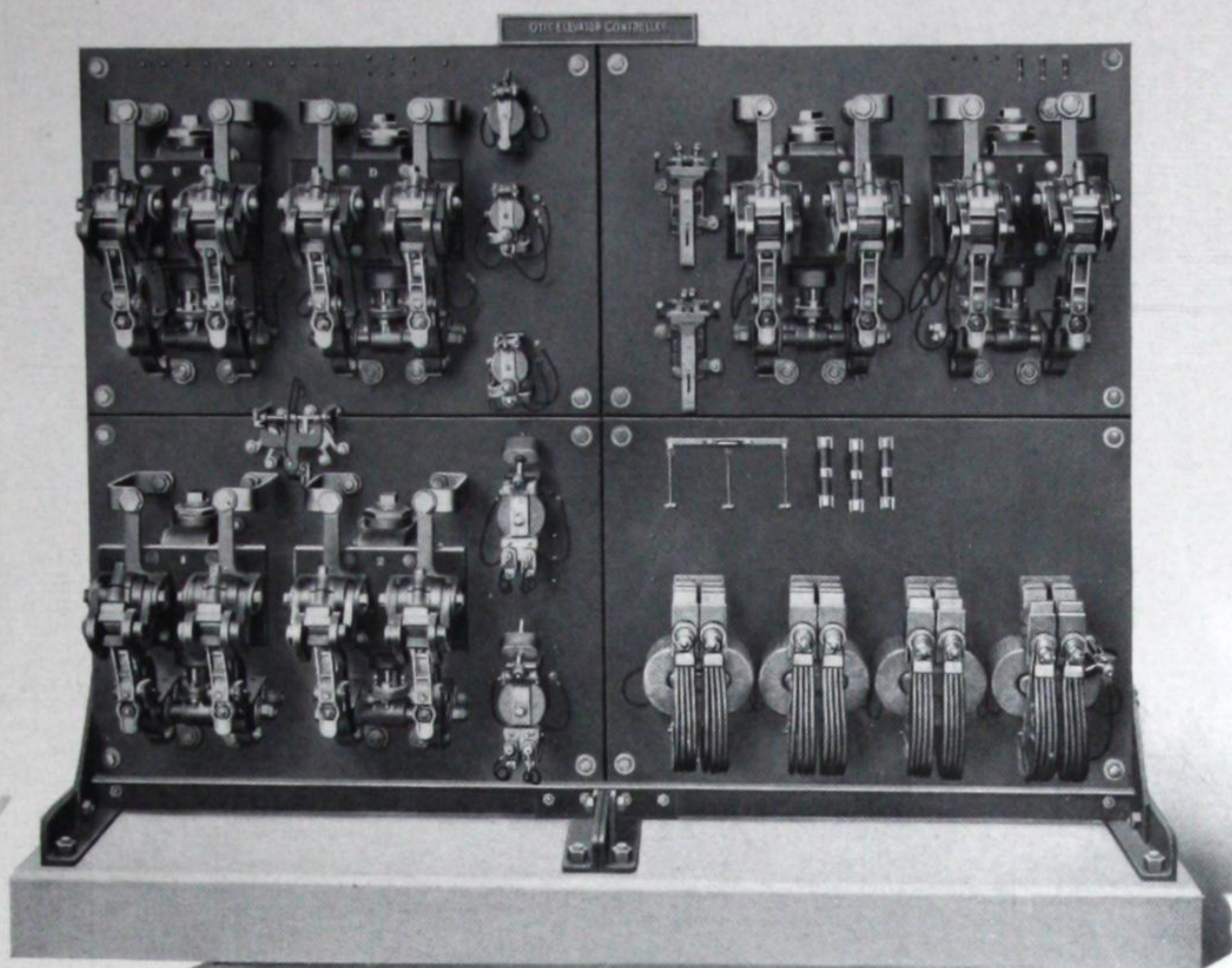




Application of Skip Hoist to Blast Furnace



Application of Skip Hoist to Limestone Plant



Otis Full Automatic Skip Hoist Controller Alternating Current

The illustration shown above is our latest approved type of full magnet Controller, designed for use in connection with the Otis Multiphase Alternating Current Skip Hoist, applications of which are shown on opposite page.

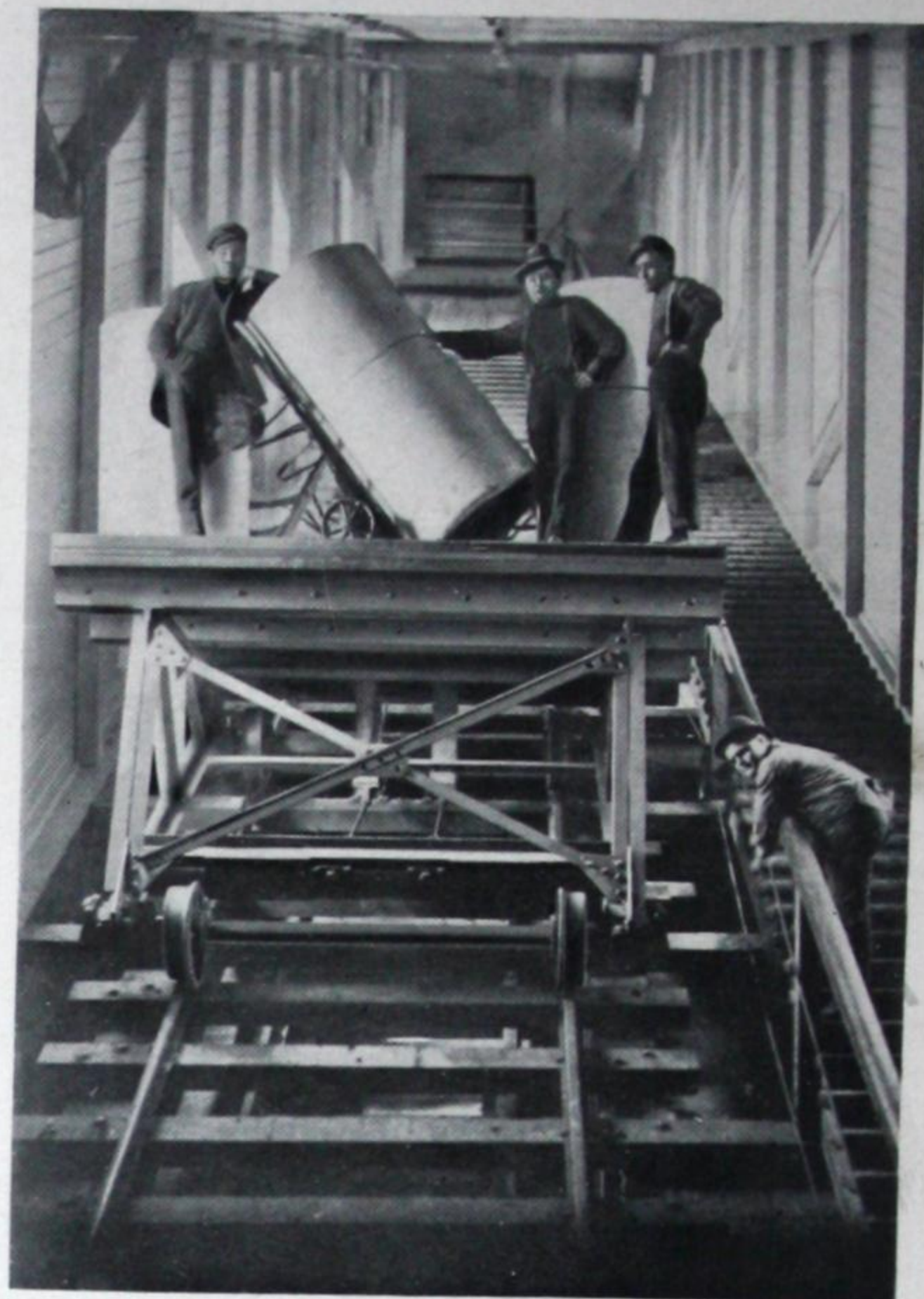
This controller is of unusually heavy and substantial construction, to withstand the severe and exacting service requirements.

All switches are provided with laminated copper contacts and protected by auxiliary copper contacts and carbon breaking contacts, which are also protected by powerful blowout magnets where required.

POWELL RIVER PAPER COMPANY

POWELL RIVER
BRITISH COLUMBIA

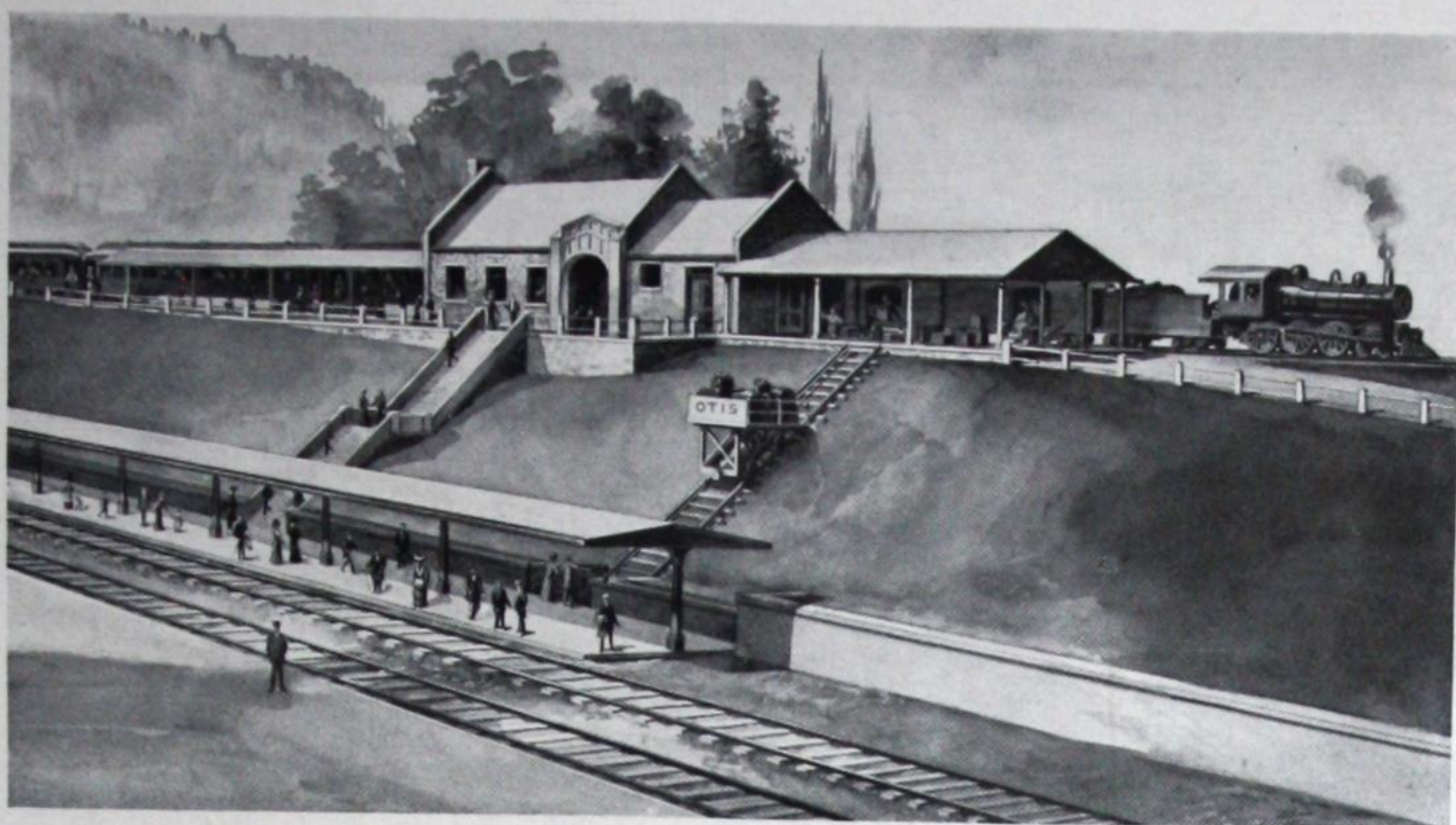
This Incline is of the Commercial type, designed to carry loads of paper weighing 60,000 pounds, on an incline of 32 degrees from the horizontal, and is for the purpose of distributing this material to the various levels of the paper mill as desired. This particular Incline is operated by means of Hand Rope Control, although for similar



service an operating switch may be employed.

There are numerous instances where this type of Incline may be used to advantage; each individual case, however, requires special consideration due to varied conditions, such as load, speed, angle of incline, voltage, safety features, control and arrangement of landing.

Special data sheets are provided as a guide in submitting data for estimate.



OTIS INCLINE BAGGAGE HOIST

The above illustration shows the application of an Otis Incline Baggage Hoist for use in transferring baggage at railway junctions where a difference in the level exists between the station platforms, permitting of a quick, easy and efficient means of transferring baggage to and from each platform.

These Incline Hoists can be operated by either direct or alternating current, with mechanical or electrical control. They are provided with the usual automatic safety devices and can be operated with single platform, with or without counterbalance, or with double platform in balance with each other.

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Chicago—Main Office: 600 West Jackson Boulevard.
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Atlantic City, N. J.—14 North Presbyterian Avenue.
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Charleston, W. Va.—19 Hale St.
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Brighton, Eng. " "
Glasgow, Scotland " "
Liverpool, Eng. " "
Manchester, Eng. " "
Newcastle, Eng. " "
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Factory: Berlin-Wittenau.

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Rio de Janeiro, Brazil—Guinle & Co., Avenida Central, 107.
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Buenos Aires, Argentine—Buxton, Cassini & Co., Calle Suipacha Esq., Tucuman.
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